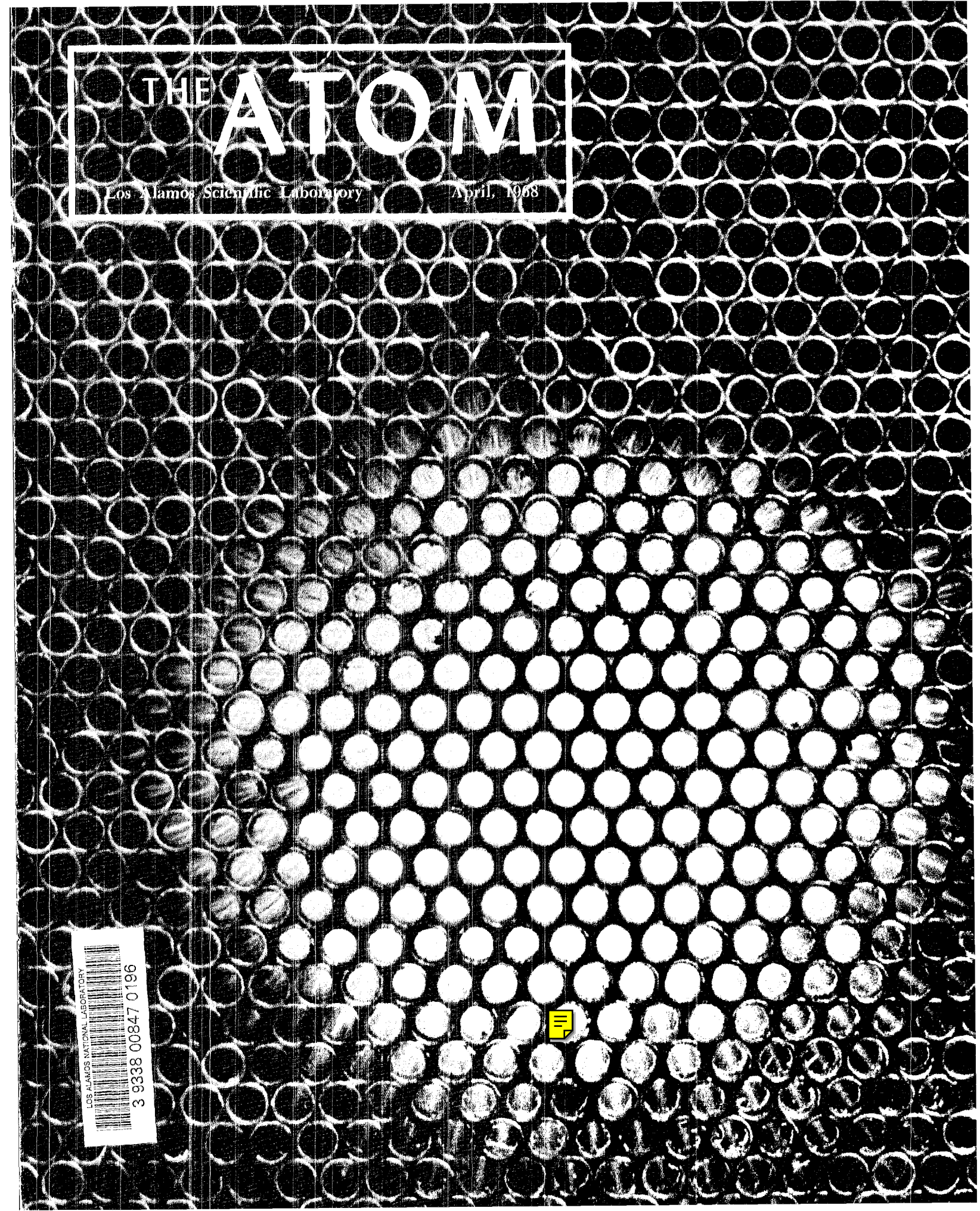
THE ATOM

Los Alamos Scientific Laboratory — April, 1968



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THE ATOM

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About the Editor

An experienced newsman-photographer-printer . . . who began his career as a printer's devil 14 years ago . . . with this issue becomes editor of The ATOM.

Kenneth J. Johnson, 28, came to LASL from Gunnison, Colo., where he was editor of the weekly Gunnison Courier for the past three years. Although he is a native of South Dakota, and a 1961 graduate of South Dakota State College, Johnson decided to remain in the Rocky Mountain Region after Army service at Fort Carson, Colo. (The fact that he is a skier, coupled with his marriage to a Colorado girl, played a large part in his decision to stay in the area.)

Johnson has become acquainted with practically every facet of the communications media since his first job with the Potter County News, Gettysburg, S.D. in 1954. He has worked as a photographer . . . free-lance writer . . . college news bureau writer . . . linotype operator . . . radio announcer . . . newspaper reporter . . . feature writer . . . U.S. Army Information Officer . . . ad salesman . . . column writer . . . and editor.

COVER:

(Photo by Bill Jack Rodgers)

What might appear to be an attractive fence, at first glance, is really a closeup photo of a collimator, used to make neutron radiographs. The collimator consists of approximately 2,500 12-inch lengths of stainless steel tubing. Complete story on neutron radiography begins on page 2.

short subjects

Dr. Gerold H. Tenney, technical adviser at LASL on nondestructive testing, gave two lectures in Sydney and Melbourne, Australia last month and will speak in Honolulu April 30.

As a guest of the Nondestructive Testing Association of Australia, Tenney lectured before members of the N. S. W. Branch of the Association in Sydney on "The Role of Nondestructive Testing as a Worldwide Profession." His talk, "Is Nondestructive Testing Keeping in Step with the Rapid Metallurgical and Technological Progress?", was given at Melbourne University.

Four LASL physicists have co-authored a report in the Feb. 19 issue of "Physical Review Letters," a publication of the American Physical Society. The report is on new particles detected in the solar wind by instruments on Vela Satellites. The observations made by the four men are expected to aid solar theory and to provide a better understanding of some kinds of radio interference and the aurora through direct measurements of particles in the solar wind. Authors of the report are **Samuel J. Bame, Jr., John R. Asbridge,** and **Ian B. Strong,** all of P-4; and **Arthur J. Hundhausen,** T-12.

Dr. Carroll W. Zabel, former staff member at LASL, has been elected chairman of the Atomic Energy Commission's Advisory Committee on Reactor Safeguards (ACRS) for 1968. Zabel, director of research and associate dean of the graduate school at the University of Houston, Texas, served as vice chairman of the committee in 1967. He was alternate K division leader at LASL in 1961.

Dr. Nelson Jarmie, P-DOR, recently served as a visiting lecturer at Northern Arizona University, Flagstaff.

His visit was under the auspices of the American Association of Physics Teachers and the American Institute of Physics as part of a broad, nationwide program to stimulate interest in physics.

Three More Laboratory Employes Retire

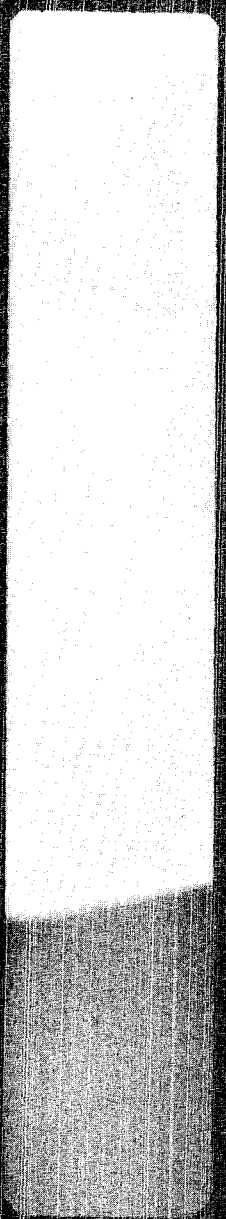
Naomi B. Smith, senior accounting clerk in AO-2, retired Jan. 31. Born in Milford, Ill., she lived in Earl Park and Petersburg, Ind., for a time. In 1950 she came to Espanola to work as bookkeeper for a telephone company, and also worked at the First National Bank in Los Alamos before joining the Laboratory in April, 1954. She first worked in AO-1, then transferred to AO-3 in 1955, and to AO-2 in 1960. Mrs. Smith has two sons, Branson, of Tucson, Ariz., and Glenn, of Earl Park, Ind., plus four grandchildren and one great-grandchild. She plans to continue living in Los Alamos.

Robert E. Agner, maintenance mechanic in SD-O, retired Feb. 29. He joined LASL in August, 1957, as a machinist in SD-1. A native of Evansville, Ind., he has spent most of his life in that city, except for nine years in Chicago. Agner and his wife, Alma, plan to continue living in Espanola after retirement and will also do some traveling this summer. They have two daughters: Pat (Mrs. Fred Wittman) of Los Alamos; and Sherry (Mrs. William Cornwell) of Brazil, Ind.

Leslie E. McCartney, a chemical plant operator in GMX-3, retired Feb. 29. He was born in Riverton, Neb., but worked for 20 years in Colo. prior to coming to Los Alamos. He joined LASL Jan. 2, 1946, in the Supply and Property Dept. as senior clerk, and when cost accounting was inaugurated for LASL, his group was chosen to initiate the transition. The entire group became part of the Accounting Dept. on April 1, 1950. McCartney transferred to GMX-3 in April, 1951, and has been with that group since as a chemical plant operator. His wife, Margaret, is a long-time employe of GMX-7. Four children are Edward (Jim), now a dentist in Santa Rosa, Calif.; Mary Lou (Mrs. Albert Nadon) of Denver, Colo.; Sally (Mrs. William Berry) of Palo Alto, Calif.; and Steven, a sophomore at the University of New Mexico. McCartney intends to remain in Los Alamos.

Neutron Radiography

By Bob Masterson



This is a neutron radiograph of a plasma thermocouple pin containing U-235 and U-238. The U-235, top, stands out clearly from the U-238 in the lower section of the pin. The two regions appeared almost identical in an x radiograph.

A new type of neutron collimator, (a device for producing a parallel beam of neutrons) recently developed by Donald A. Garrett and Roger A. Morris of the Nondestructive Testing Group (GMX-1) of the Los Alamos Scientific Laboratory, has made possible the application of high resolution neutron radiographic techniques to specific nondestructive testing and inspection problems encountered in the Laboratory's research and development programs. The collimator design was based on data from a master's thesis written by Morris in 1965.

Radiography, the process of making a picture on a sensitive surface by the use of radiation other than light, began with the discovery of

x rays in 1895 by the German physicist Wilhelm Roentgen. Probably never in the history of science has a basic discovery been put to practical use so quickly; four days after the news of Roentgen's discovery had reached the United States, x rays were used to locate a bullet in a patient's leg. Since then x radiography has come to be widely used in medicine, scientific research, and industry.

The neutron, the neutral particle that is a fundamental building block of atomic nuclei, was discovered by James Chadwick in 1932. The neutron's potential for radiography was quickly realized, and work on neutron radiography was begun in Germany in 1935. The early work in this field in the 30's and 40's was hampered by the lack of adequate neutron sources. It wasn't until the late 50's when nuclear reactors became available for research that real progress in the development of neutron radiography as a useful tool began to be made. Reactors are able to produce beams of thermal neutrons millions of times more intense than those obtained from the accelerators and radioactive sources (such as radium-beryllium mixtures) which had previously been the only practical sources of neutrons.

Since the early 60's, as nuclear reactors have become increasingly available as neutron sources and as the demands on nondestructive testing have increased, the techniques of neutron radiography have been refined to the point where it has become a practical inspection method.

Neutron radiography, however, will not replace x-ray techniques but rather will complement them. For most inspection problems requiring radiography, x rays serve very well, but for certain special types of problems neutron radiography offers advantages. These advantages are based on the differences in the way x rays and neutrons are absorbed by matter.

X rays and gamma rays, also used in radiography, are simply electromagnetic waves, identical to light except for their much greater energies and much shorter wave lengths which enable them to penetrate greater thicknesses of matter. X-ray and gamma-ray photons, like the photons of visible light, interact and are absorbed by matter through interactions with the electron shell surrounding atomic nuclei. The absorption of x and gamma rays is dependent upon the atomic number and physical density of the ab-

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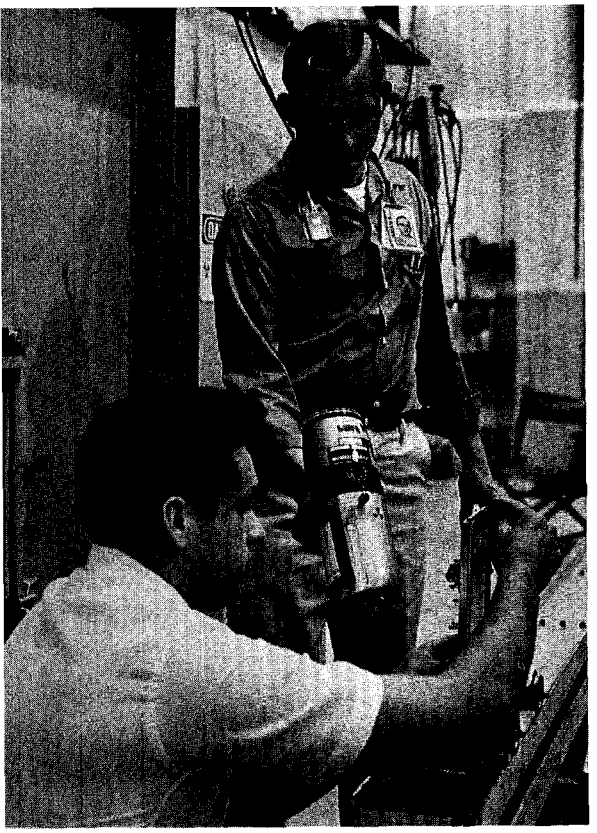
A neutron radiograph is inspected by John Yarnell, P-2 group leader, left, and Roger Morris of GMX-1. Neutron source for the radiograph was the Water Boiler Reactor.



Exposed film is removed from its mounting following a reactor run by GMX-1 Technician Jake Lucero. Glen Neely, H-1, health physics surveyor, checks the radiation level.

Neutron Radiography . . .

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sorber. The light elements such as hydrogen, carbon, and oxygen are poor absorbers of (i.e. are relatively transparent to) x and gamma rays, and the heavy elements such as iron, lead, and uranium are good absorbers (i.e. are opaque). In addition, the absorption increases smoothly in going from light to heavy elements so that elements whose atomic numbers are close to each other have almost identical x- and gamma-ray absorption characteristics. Thus x or gamma radiographs are very good for differentiation between materials of different density.

With neutrons it is a different story. Neutrons are absorbed in matter by interactions with the nuclei of atoms rather than by interactions with the electron shells, and the neutron absorption abilities of an element depend on its nuclear properties, which sometimes vary widely with elements of almost identical atomic number. In general neutron absorption is greatest for the lighter elements and decreases with increasing atomic number with wide variations from element to element and even from isotope to isotope of the same element. These characteristics of neutron absorption permit the use of neutron radiography in special situations, where x or gamma radiography is ineffective, such as detecting light materials like water or plastic encapsulated in materials of high atomic number, detecting certain elements in a matrix of another element, and differentiating between isotopes of the same elements. All of these applications of neutron radiography have been made at Los Alamos by Garrett and Morris in their study and development of this new method for nondestructive testing.

This development of neutron radiography has been part of the GMX-1 group's continuous program of investigating and developing new nondestructive testing methods in order to ensure the availability to the Los Alamos Scientific Laboratory of the latest inspection techniques.

The preliminary work at LASL in neutron radiography was begun in 1963 by a summer student from the University of Texas and Roger Morris on a part-time basis. These early efforts were directed and encouraged by Bruce Blanks, GMX-1 alternate group leader, who was then head of the GMX-1 Radiation Section. Donald Garrett, who now heads the Research and Development Section, became interested in neutron radiography while teaching and obtaining his master's degree at Louisiana State University in 1962-64. Upon his return to Los Alamos in June 1964 he started an active effort in this field as part of a program of neutron applications to nondestructive testing.

Since then Garrett, Morris, Blanks, and other GMX-1 personnel have conducted many studies and a long series of experiments and tests using neutron beams from the Water Boiler Reactor and the Omega West Reactor. They have received much assistance in conducting these experiments from the members of the P-2 group including Group Leader John Yarnell, who was advisor to Roger Morris for his master's thesis, Reactor Supervisor Bill Starner, Reactor Operator Tom Robinson, and former P2 group members Henry Motz and Whitey Thorpe, now with P-DO and N-6 respectively. Considerable support has also been received from Glen Neeley, H-1 health physics surveyor.

These studies and tests of various collimator designs; arrangements of collimator, object, and film; and techniques of controlling the exposure time have resulted in the current collimator design and exposure procedure which produces neutron radiographs with sharpness and clarity comparable to x or gamma radiographs.

The new collimator consists of stainless steel tubing (0.083 inches in diameter) stacked in a rectangular array four inches square and 12 inches long enclosed in an aluminum box. The only tubing available with the proper degree of straightness and the proper wall thickness (0.01 inch) was tubing intended for the production of hypodermic needles.

This collimator is inserted into one of the neutron beam ports in the Water Boiler Reactor. The neutrons from the reactor core pass through the collimator and those neutrons whose paths are not aligned with the tubing must pass through the tubing walls and tend to be absorbed and removed from the beam. Therefore the beam emerging from the collimator consists mainly of neutrons whose paths

closely parallel the axis of the collimator. The quality of the radiograph depends very strongly on the quality (degree of collimation) of the beam since a diffused or scattered beam produces a blurred image. A good analogy is the sharp clear shadow produced by the highly collimated light from the sun and the blurred shadow produced by the diffused light from a fluorescent light fixture.

The advantage of the new collimator is its ability to produce a high degree of collimation while reducing the neutron flux in the beam (the number of neutrons passing through a given area per unit time) by only a factor of 100, from 100 million neutrons per square centimeter per second (1×10^8 n/cm^2-sec) to one million n/cm^2-sec. This collimated beam intensity is sufficient to allow exposure times short enough, on the order of two hours, to make the method practical.

The collimator does produce a pattern in the beam caused by absorption of neutrons parallel to the tubing but exactly in line with tubing walls. At distances of about two feet this pattern has disappeared due to the slight divergence of some of the collimated neutrons.

In an actual radiographic setup, the object to be radiographed is placed in line with the collimated beam at a distance between two and three feet from the face of the reactor. The film is placed beyond the object in a standard x-ray film cassette mounted on a small movable cart controlled from the reactor control room. The film exposure is made by adjusting the reactor power to the appropriate level and remotely moving the film cart into position behind the object and then back out of the beam after the desired exposure.

The latent image on the radiographic film is not actually formed by the neutrons. The film is mounted in the cassette in contact with a sheet of gadolinium foil 0.001 inch thick. The neutrons passing through the object react with the gadolinium nuclei to produce electrons which in turn produce the latent image of the object. The use of the gadolinium "converter" foil has two advantages. The neutrons react with the gadolinium nuclei with a very large reaction probability (cross section). Thus the foil, in effect, converts almost all the neutrons into electrons, which have a much greater probability than neutrons of interacting with the photographic emulsion on the film. Therefore, the electrons give a much more intense image than would the neutrons, most of which would just pass through the film without affecting it.

In addition, since the electrons have a much shorter range in the film than the neutrons, (that is they are less likely to be scattered off their original paths before interacting and exposing the film) the electron-produced image is much

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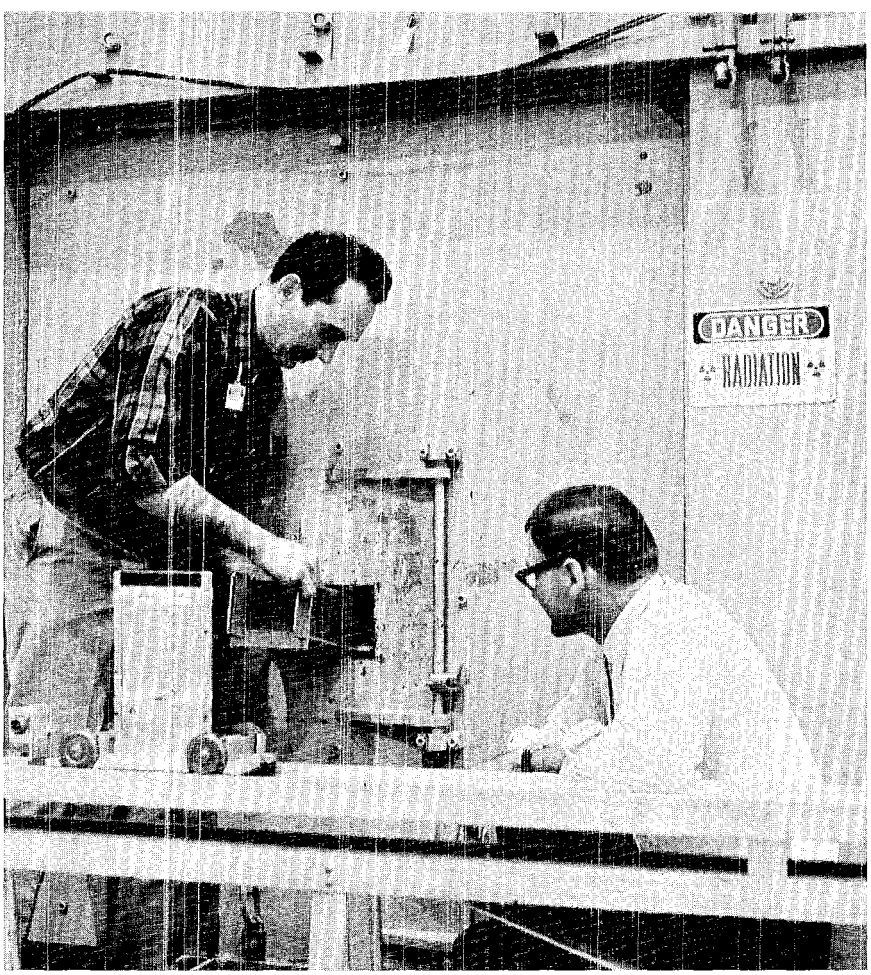
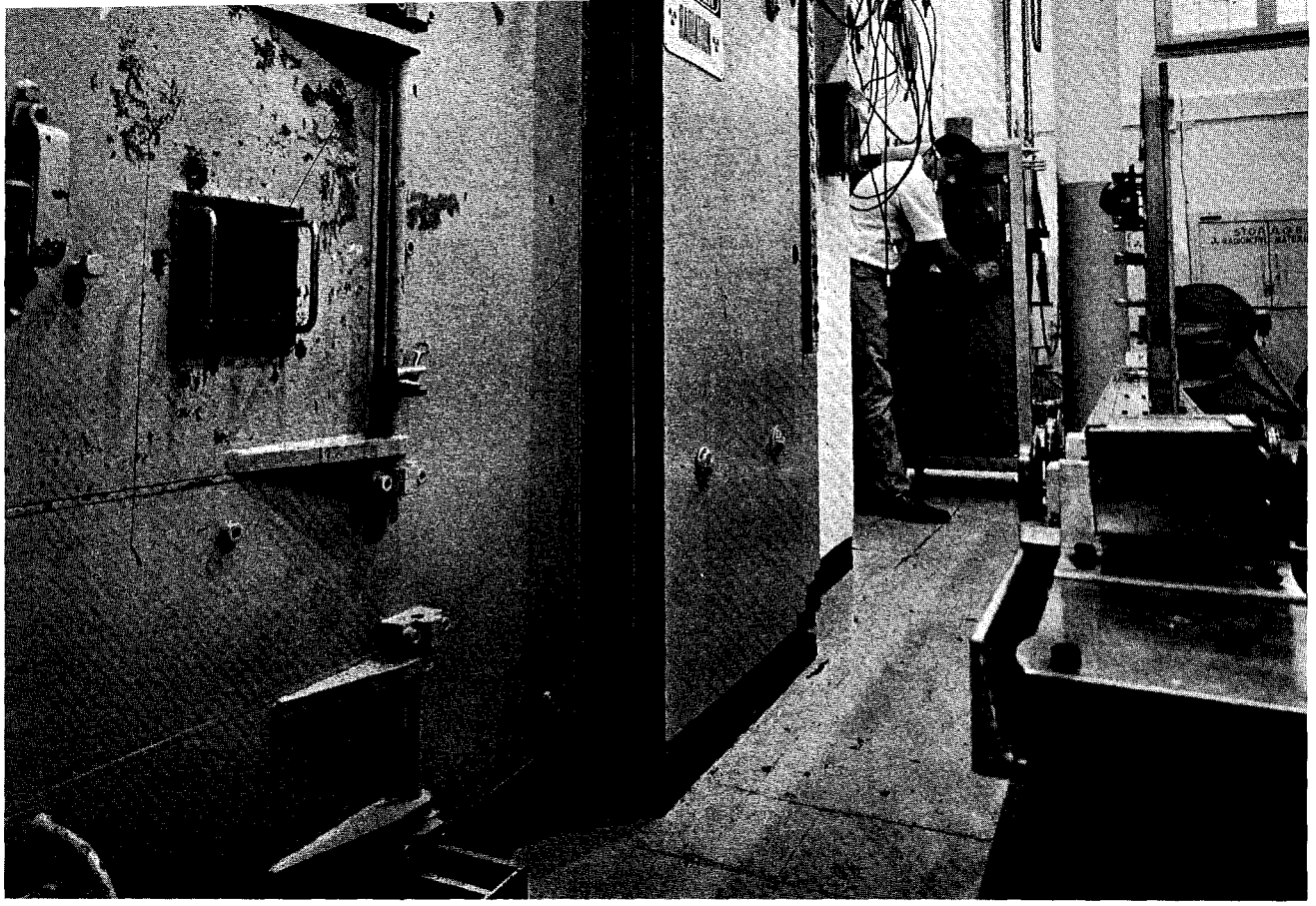


Neutron collimator is inserted into a beam port of the Water Boiler Reactor by Roger Morris. Morris and Donald A. Garrett, both of GMX-1, are the developers of the collimator.



Film exposure is accomplished by running the film cart, right, into and out of the reactor's neutron beam. Jake Lucero, GMX-1 technician, is shown at the panel from which exposure time is controlled.

Neutron Radiography . . .

continued from preceding page

sharper than an image produced directly by the neutrons.

This is the neutron radiographic technique—hypodermic tube collimator, object, and cart-mounted film-converter foil pack—that is now being put to use by GMX-1 to solve specific inspection problems. Examples of specific applications serve to demonstrate the special advantages in certain situations of neutron radiography over x or gamma radiography.

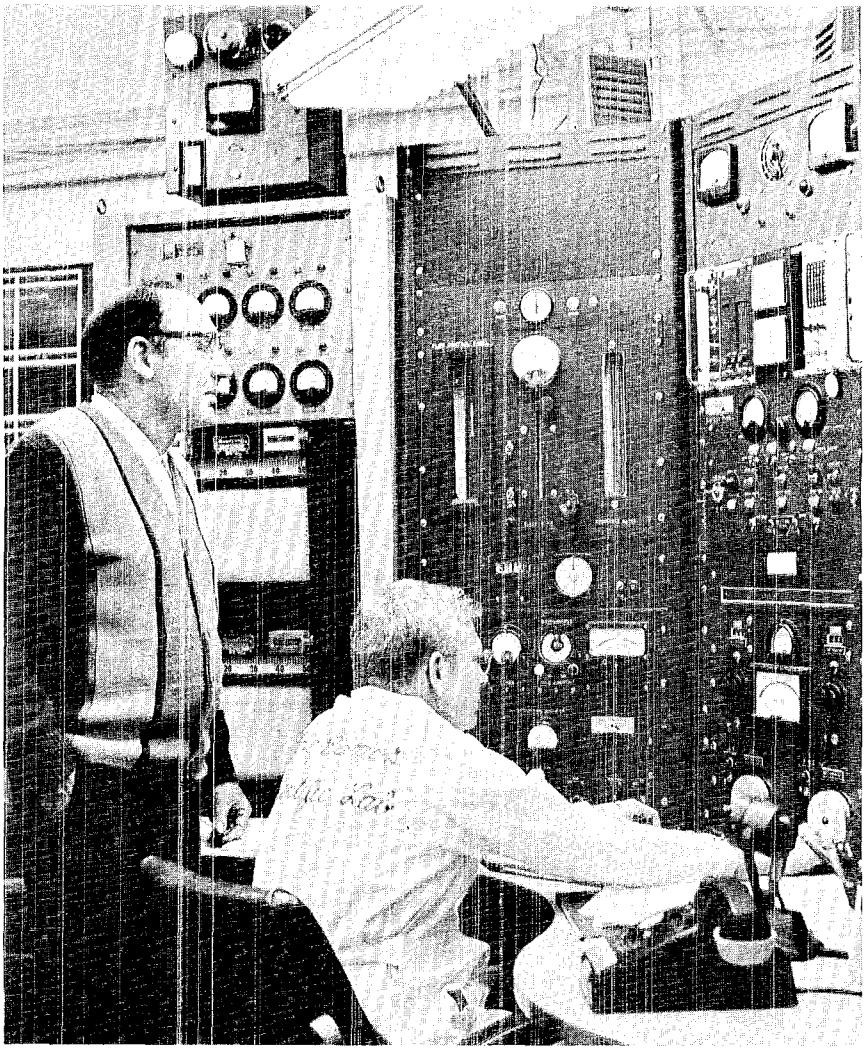
One of the most graphic demonstrations of the usefulness of neutron radiography involved the detection of a synthetic rubber O-ring seal inside a complex steel forging. A radiograph made with gamma rays from an iridium-192 source, showed no trace of the seal, whereas a neutron radiograph made by Garrett and Morris clearly showed that the seal was in proper position.

Similarly, x radiographs of plasma thermocouple fuel pins containing uranium-235 and uranium-238 segregated into two regions failed to show clearly the boundary between the two isotopes since to x rays they are almost identical. But the two uranium isotopes have quite different neutron absorption characteristics and the interface between them in the fuel pin is much more apparent and better defined in a neutron radiograph.

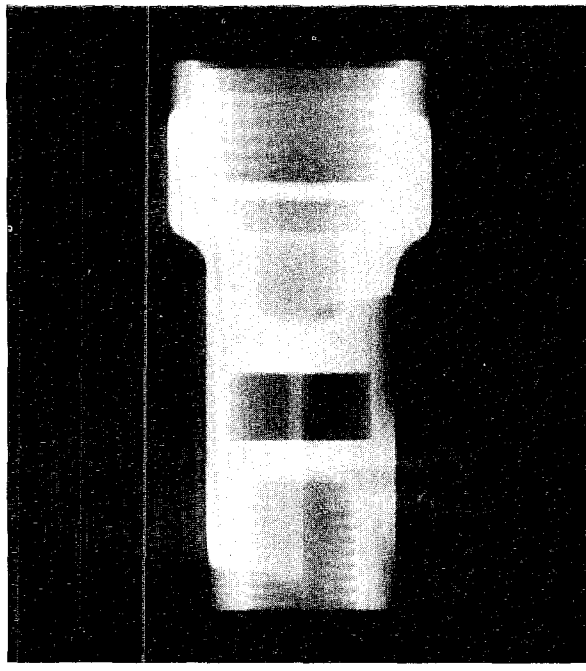
In another case, an explosive detonator that had misfired was radiographed with neutrons to reveal a partial burnup of the explosive. An x radiograph of the same detonator shows only its metal components. The information provided by the neutron radiograph is of course invaluable to investigators interested in the cause and prevention of detonator misfires.

Other recent applications here at LASL include the location of the working fluid (in this case water) in an operating heat pipe and the location and inspection of organic sealants and bonding agents in leaking pumps and valves.

The further potential applications of neutron radiography both at Los Alamos and elsewhere are enormous, especially in the areas of reactor and nuclear technology. The inspection of reactor fuel plates, neutron absorbing control rods, and neutron shielding material are only the most obvious

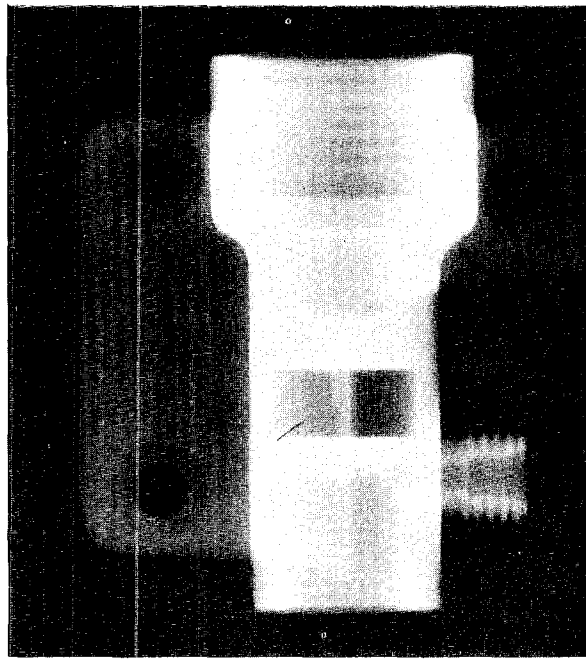


A reactor run is started at the control panel by Operator Tom Robinson. Bill Starner, left, is supervisor of the Water Boiler Reactor, from which neutrons are provided for GMX-1 radiographs.



Neutron radiograph of a steel forging clearly showed that a rubber O-ring was in its proper position.

An x radiograph of the same steel forging shown above failed to indicate whether or not the rubber O-ring was in its proper place.



ones. Work is continuing in GMX-1 to help ensure that the potential of neutron radiography is realized.

The current research and development program includes further efforts to improve the operating procedures such as an investigation of the use of a second collimator placed between the object being radiographed and the film pack. This collimator would serve to reduce greatly the number of scattered neutrons reaching the film. Such scattered neutrons serve only to blur the image. Along with this development work studies are being carried out which are aimed at revealing the fundamental principles—the physics—which determine the capability and quality of neutron radiography.

The end results of both this experimental and theoretical work will undoubtedly be an even further improvement in neutron radiography and a further increase in GMX-1's capability for nondestructive testing and inspection.

Service Awards Go to 191 LASL Employes

A total of 191 persons were recognized recently for their years of service as employes of the University of California at the Los Alamos Scientific Laboratory.

Pins, designating 20, 15 and 10 years of service were presented by LASL Director Norris E. Bradbury.

Of the total, 66 were 20-year pins. Honored for 15 years of service were 78, while 47 others received 10-year pins.

20 Year Pins

Receiving 20-year pins were Ernest C. Anderson, H-4; Michael J. Archer, J-8; Glen B. Barber, J-12; Philip F. Belcher, D-DO; Curtis A. Bond, GMX-3; William T. Bond, J-8; Edward Casados, GMX-3; James B. Deal, Jr., CMB-7; Cecil G. Delano, CMB-7; Benjamin C. Diven, P-3;

John W. Enders, H-1; Philip F. Fochee, GMX-3; Alvin G. Fox, CMB-6; Elias E. Garcia, SP-3; Gilbert G. Garcia, H-1; Marian Gibbs, CMF-5; Harry Gregersen, SD-2; Stanley W. Hall, P-12; Ellwood B. Johnson, ENG-2; Edward T. Jurney, P-2;

Eleanor Langenbrunner, SP-2; Lloyd E. Lanham, CMB-7; Henry L. Laquer, CMF-9; Herman Lucero, SP-4; Pat McAndrew, MR; Alfred E. Marchand, GMX-7; Jose I. Martinez, GMX-2; Robert R. Martinez, K-4; Morris F. Milligan, H-5; Joe G. Montoya, CMF-4;

Richard C. Neal, N-3; Max G. Newman, SD-3; Donald E. Nuckolls, CMB-6; Robert L. Osborn, H-1; Luis Pacheco, ENG-4; Leslie P. Page, Jr., K-4; Robert A. Penneman, CMF-4; Joseph J. Petranto, W-1; Donald D. Phillips, J-12; Celestino G. Quintana, J-8;

Carroll A. Rendell, CMB-11; John A. Richards, SD-2; Lee W. Riedel, D-8; Joseph W. Romero, CMB-11; George N. Rupert, CMB-3; Lee F. Sanchez, GMX-3; Arthur G. Sena, CMB-8; Ralph K. Spotts, N-4; Emory J. Stovall, Jr., P-18; John H. Sullivan, CMF-4;

Bergen R. Suydam, T-DO-T; Joe A. Tapia, GMX-3; Marjorie Terrell, GMX-7; Charles W. Trask, ENG-1; John L. Tucker, GMX-7; Manuel J. Urizar, GMX-2; Raymond C. Vandervoort, CMF-4; Petasho Vigil, CMF-5; Tranquilino Vigil, SP-4; Glenn A. Vogt, ENG-4;

William G. Warren, J-11; Jacob J. Wechsler, W-1; Beverly A. Wellnitz, W-4; Boyd W. West, AO-DO; Ralph A. Wicklin, N-5; William E. Wood, GMX-3.

15 Year Pins

Those awarded 15-year pins were William J. Alves, Jr., SD-1; Ralph E. Anderson, T-1; Ruben F. Archuleta, H-4; William P. Basmann, GMX-11; Robert H. Bates, AO-4; Horace R. Baxman, CMB-8; George I. Bell, T-DO-T; Joe Bergstein, K-4; Victor A. Bond, ADP-SF; Helen I. Boyer, D-8;

Alvin L. Brown, P-1; Robert J. Bueschel, SD-5; Mildred D. Capron, H-1; Johnny F. Chavez, GMX-6; John L. Cole, Jr., J-1; Jerry P. Conner, P-4; Arthur N. Cox, J-15; Irene Z. Crawford, GMX-3; Richard K. Davey, GMX-2; Bon Diaz, MR;

Allen R. Driesner, N-1; Bruce J. Dropesky, J-11; Wallace L. Drumhiller, CMB-3; Reginald R. Dube, GMX-4; Joe L. Duran, T-1; Dale S. Fisher, CMB-6; Thurman G. Frank, N-5; James J. Glass, CMB-6; Neel W. Glass, J-16; Ferdinand B. Gonzales, SP-3;

Glen A. Graves, N-2; Lewis F. Green, GMX-3; Arthur H. Greenwood, P-1; James A. Grundl, N-2; Oscar S. Harrington, CMB-7; Marvin M. Hoffman, J-12; Harry S. Jordan, Jr., H-8; Robert W. Keil, CMB-6; Daniel J. Kelly, N-5; Margarito E. Lopez, SD-1;

Augustine Lujan, GMX-3; Buford C. Lyon, J-DO; Joe E. Macstas, PER-1; Felipe T. Martinez, CMB-AP; George Martinez, GMX-6; Pedro E. Martinez, MR; Vera G. Martinez, D-2; James E. Mayer, J-16; Nicholas C. Metropolis, T-DO-T; Tressa U. Minshall, P-1;

Robert N. Mitchell, H-5; Evelyn M. Newell, D-3; B. Jeanne Nordberg, H-3; Horace E. Noyes, SP-DO; John A. O'Rourke, CMF-13; S. Robert Orr, T-5; Marjorie A. Orth, PUB-DO; Peter J. Peterson, CMB-14; Frederick J. Roach, MR; William H. Roach, N-2;

Samuel Romero, AO-5; Maria T. Roybal, GMX-7; Robert H. Sherman, CMF-9; H. Louise Smith, J-11; Marcella V. Southard, SP-3; William A. Spencer, GMX-3; David W. Steinhaus, CMB-1; Fred L. Stewart, GMX-1; Stephen D. Stoddard, CMB-6; William R. Stratton, N-2;

Neville A. Struebing, J-DO; William E. Tynan, SD-5; Mark B. Wells, T-7; Kenneth J. Wilson, PER-6; David F. Woods, T-6; John L. Yarnell, P-2; Billy D. Blevins, J-5 (NTS); Ted A. Lough, J-5 (NTS).

10 Year Pins

Ten-year pins were awarded to Dale D. Armstrong, P-12; S. June Babich, SP-4; Norma J. Basmann, H-4; Delmar W. Bergen, W-8; Melvin S. Berrett, ENG-4; Eugene W. Boettcher, SD-2; Donald D. Bowdish, CMB-6; John J. Chamberlin, T-1; Joseph W. Chenault, W-3; Janet C. Chism, J-14;

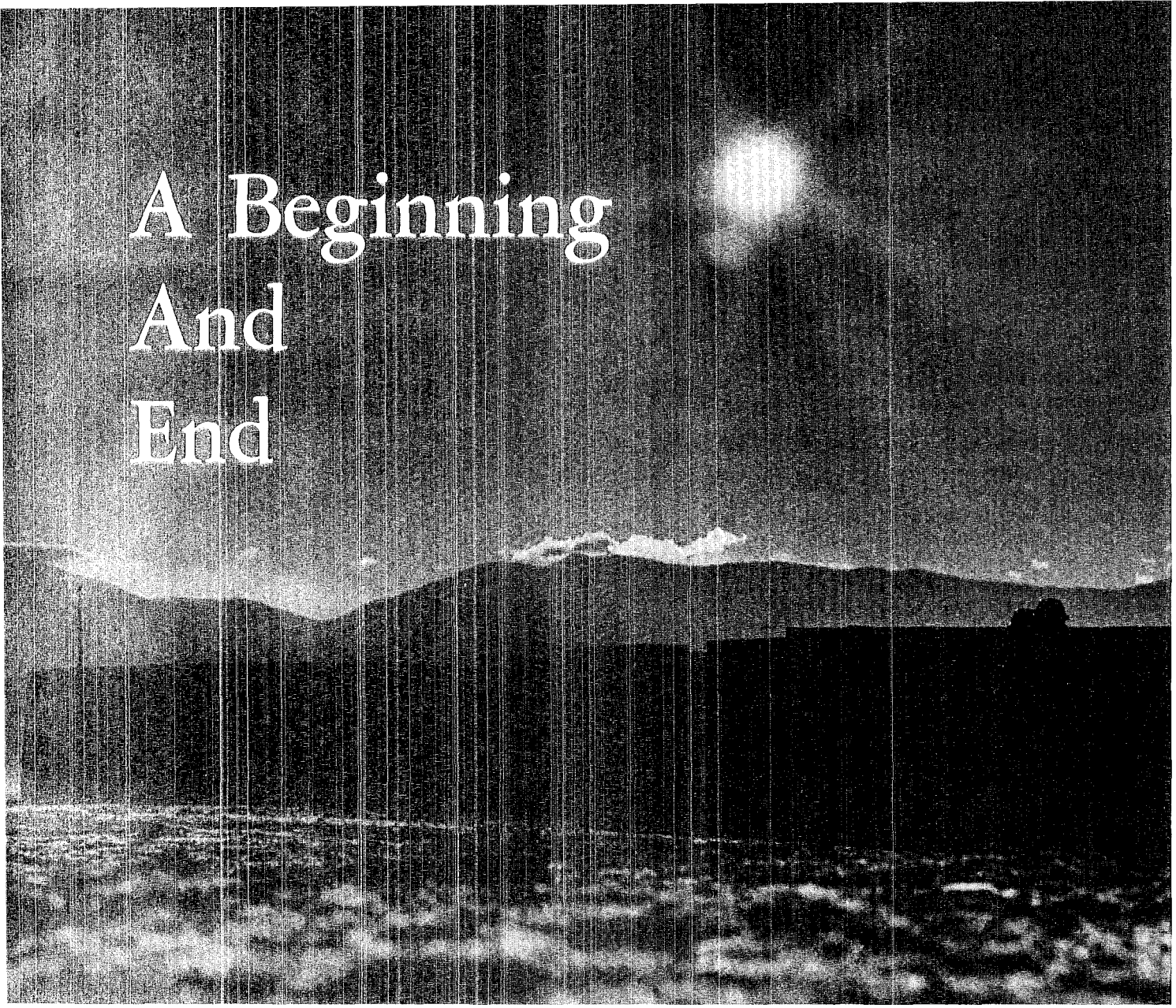
William S. Clouser, K-4; Theodore R. Crawford, J-8; William R. Daniels, J-11; John B. Downer, CMB-7; Joe M. Duran, SP-3; Donald D. Eilers, J-15; George F. Erickson, N-5; Nancy L. Freed, W-4; Mary Ann Garcia, AO-1; Paul R. Guthals, J-11;

Robert E. Hill, K-4; Everett H. Horton, J-14; Richard W. Humphrey, J-14; Dorothy M. Jobes, T-1; Douglas R. Jones, SD-O; Frederick W. Kramer, GMX-3; Lawrence H. McDowell, P-15; George F. Melton, CMB-11; Eulalia E. Newton, MR; Allen E. Ogard, CMB-11;

James B. Payne, N-7; Edward H. Roybal, MR; Jose L. Sanchez, PER-3; Jerald L. Sherwood, MP-3; Dennis D. Simmonds, T-5; Mary A. Singer, H-5; Elmer J. Sowder, Jr., J-6; Alice W. Staritzky, CMF-DO; Casimir F. Stevens, J-10; Robert D. Stoll, W-3;

Edmund K. Storms, CMB-3; Richard F. Thomas, T-5; James R. Travis, GMX-8; Richard E. Welch, N-5; Stanley K. Yasuda, GMX-2; James E. Young, T-9; Joseph W. Connell, J-17 (NTS).

A Beginning And End



Forlornly silhouetted against the rising sun is Chamisa Elementary School at White Rock. The Sangre de Cristo Mountains loom in background.

A curiosity, common to many, will be soon satisfied during open house ceremonies at two of the finest educational facilities in New Mexico. On April 21, from 2 to 5 p.m. the doors of the High School Instructional Materials Center in Los Alamos and the Chamisa Elementary School in White Rock will be open to those who have been wanting to know "what's inside?"

Many persons who live, work or frequent Los Alamos and White Rock have watched, with interest, the construction of the Center and the School from the outside. With the exception of a few, most have not seen the furnishings and their arrangement on the inside.

Although the unusual architecture of the two buildings, and the contents of each will probably receive much comment, another equally important factor, that is invisible to the eye, should also be noted.

Aside from whatever else the Center and Chamisa are or represent,

they are significant landmarks to a "beginning and end" in the annals of the Los Alamos school system. They are the first (the beginning) to be completely planned, coordinated and constructed under the supervision of local school officials and perhaps the last (the end) to be completely financed by the Atomic Energy Commission.

Prior to July 1, 1966, the date when ownership of schools in Los Alamos was transferred to the Los Alamos County Board of Educational Trustees, financing of all school facilities, grounds, and equipment was provided by the Atomic Energy Commission. School officials were invited to offer suggestions and negotiate for facilities that would support their educational programs, but final decisions on planning, coordination and construction were those of the AEC.

Although nearly two years have passed since school ownership was transferred, complete financing of the school system's two newest facilities is provided by the AEC under previous agreement. Total cost approaches $1.3 million—approximately $860,000 for Chamisa and $430,000 for the Center.

Because a majority of the children attending local schools are those of employes of the Los Alamos Scientific Laboratory, the AEC still plays a significant support role to local education, above that derived from state and county taxes. Herman Roser, Los Alamos AEC area manager, noted that funding for operation of schools in the current fiscal year, exclusive of the two construction projects, totals $1.7 million and that $1.9 million will be appropriated during the coming fiscal year, beginning July 1. AEC funds make up 39 per cent of the total school budget this year, according to Walter Smith, assistant superintendent of schools.

Under an assistance payment contract, this type of AEC funding to the local schools is tentatively scheduled to continue for at least another eight years—or until the end of the 1975 fiscal year. The AEC's con-

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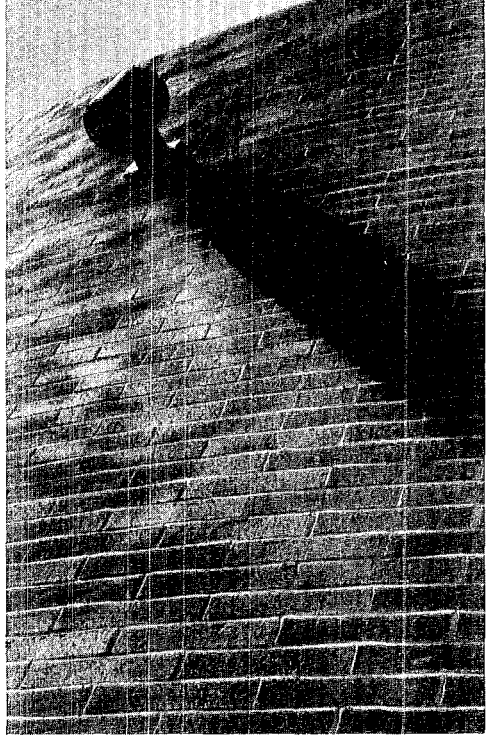
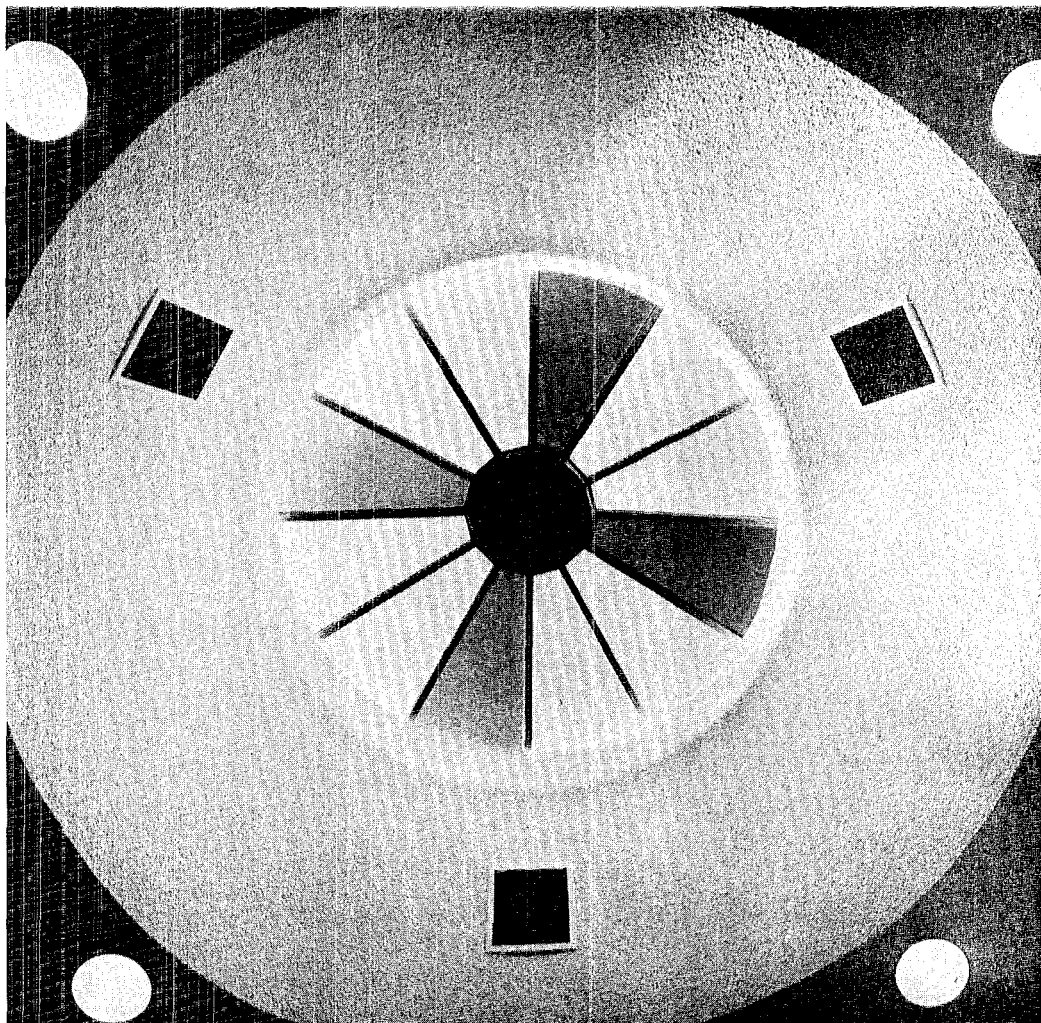
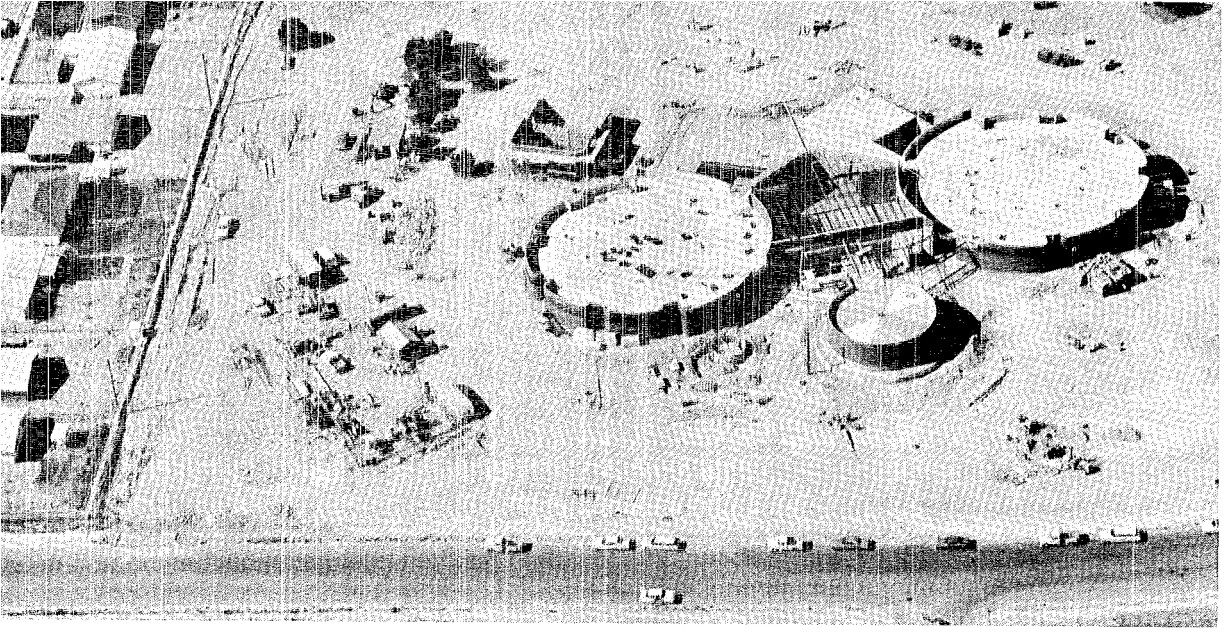


Close study of one of the three pods making up Chamisa School reveals an interesting shadow and pattern of bricks, slightly distorted because of the pod's curvature.

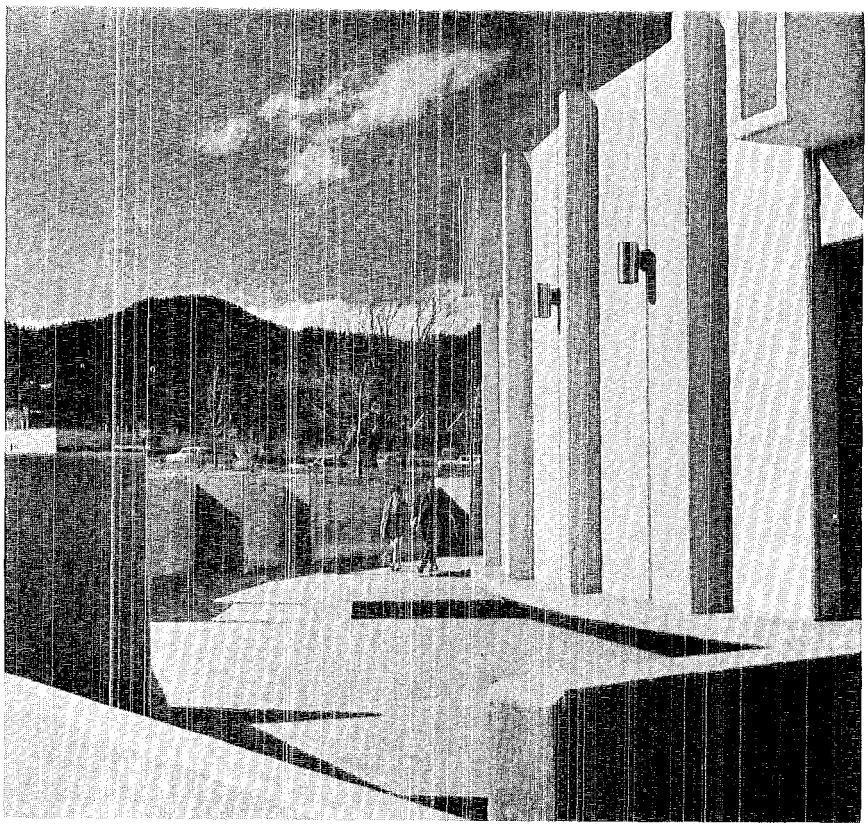
A flying saucer it's not. A floor level view of the colorful skylight at the High School Instructional Materials Center in Los Alamos it is.

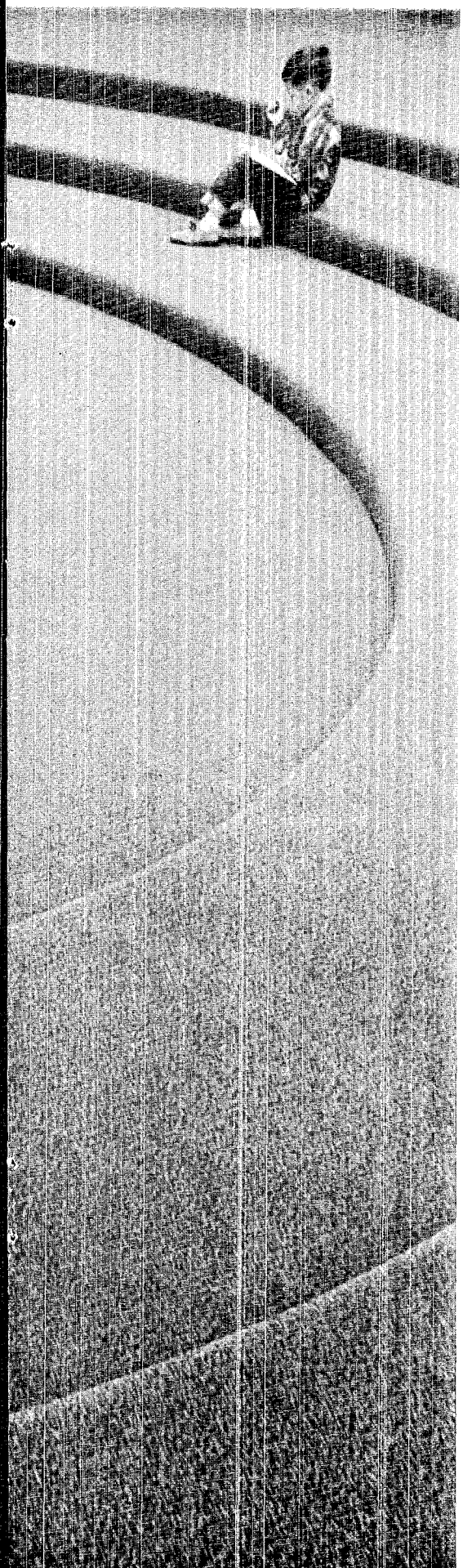




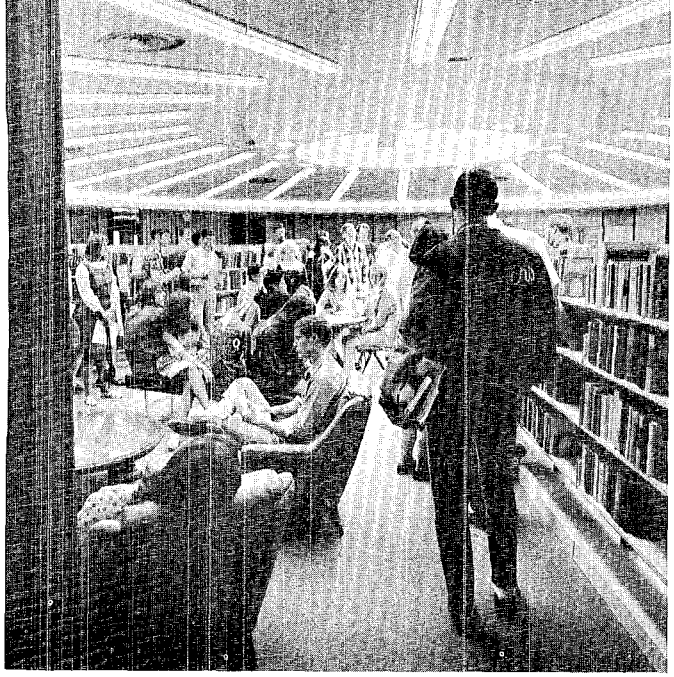
Aerial photograph, taken during construction of the Chamisa Elementary School at White Rock emphasizes the building's unusual design.

Unusual architecture of the Instructional Materials Center stands in stark contrast to the Jemez Mountains.

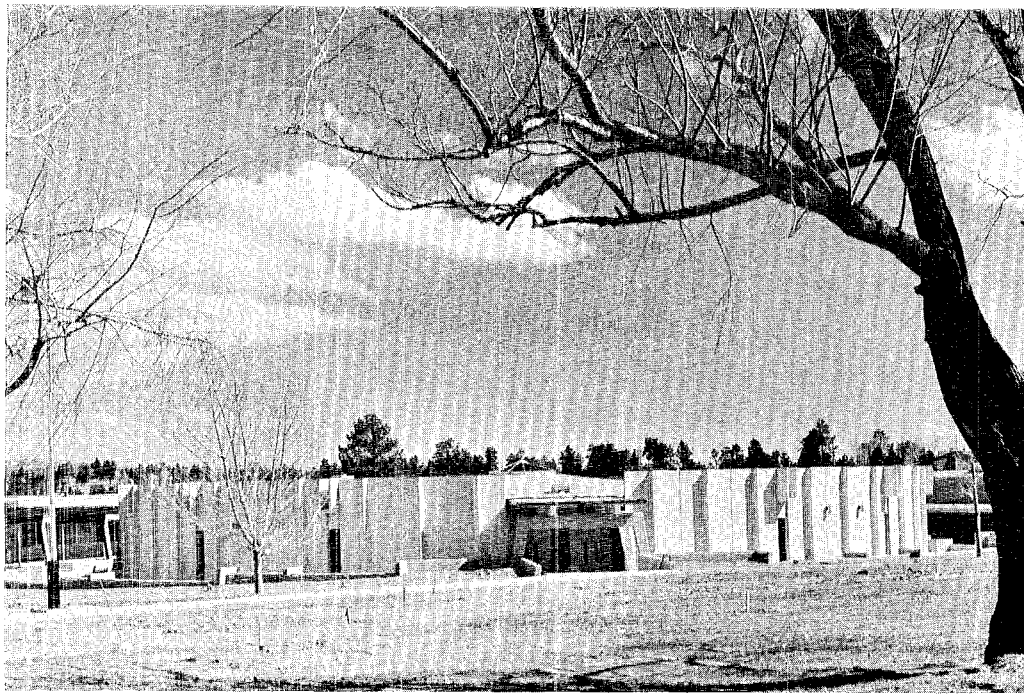




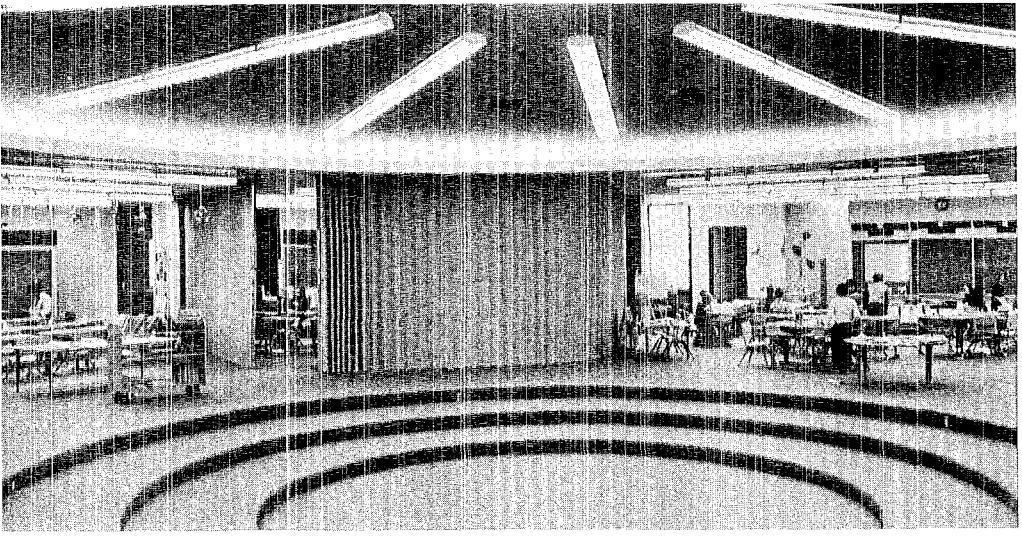
Soliloquy of a student is dramatized on the circular steps of a multipurpose room at Chamisa Elementary School.



High school students are given a tour of the library area of the newly constructed Instructional Materials Center. Bookshelves nearly conform to the arrangement of overhead lights.



The Instructional Materials Center from the outside emphasizes modern design. The building is easily accessible from others in the high school complex.



Supplementing team and individualized teaching methods at Chamisa, are moveable walls shown at center. In the foreground is the pod's multi-purpose area.

A Beginning . . .

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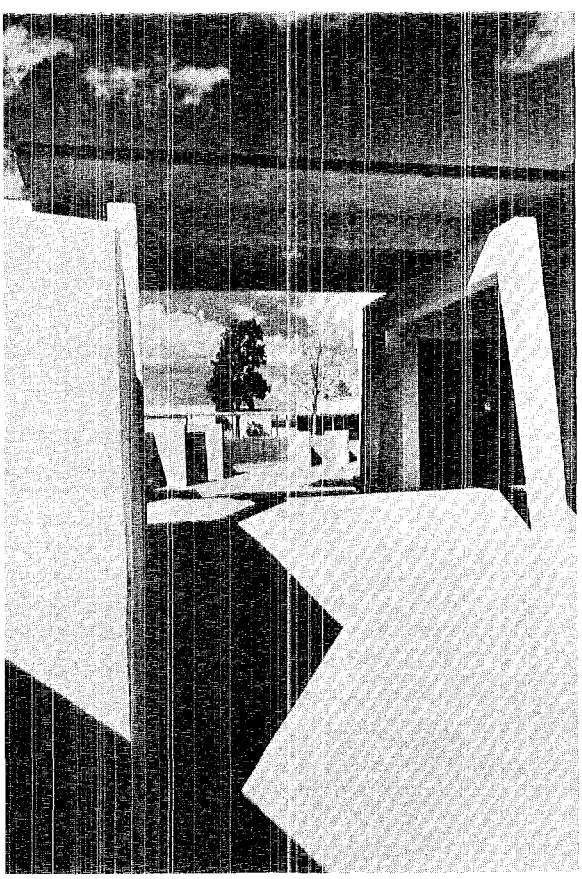


Irregular shaped wall surrounds the Instructional Materials Center. Sidewalk is recessed between the building and wall.

tribution to the operation of schools fluctuates from year to year, depending on agreements made with school officials on a yearly basis.

Future capital construction within the school system depends largely on the district's capability for self-support through bonding procedures, although the AEC has left the door open for negotiations should school needs exceed district bonding capabilities, presently $1.2 million.

The Instructional Materials Center and Chamisa School have been equipped to complement each other in a drive toward more advanced individualized teaching methods.

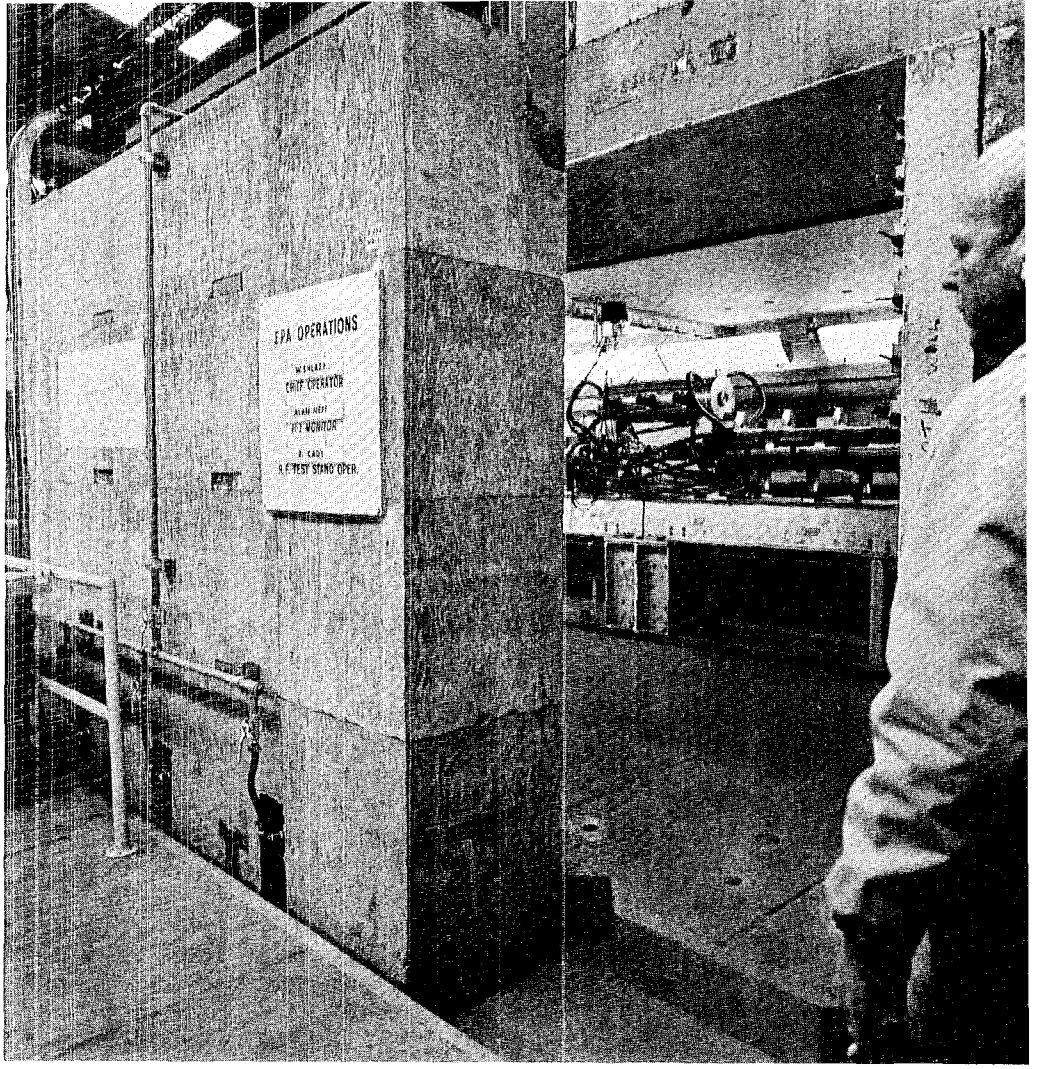
The circular construction of the Instructional Materials Center lends an appearance that is as individualized as its purpose. The Center is a unique concept in housing library and multi-media materials and equipment under one roof, in keeping with schoolwide emphasis on individualized instruction. The innovative Center has both student and professional library materials for teachers, an electronic retrieval system, and two departmental resource centers, easily accessible to students and faculty alike. As a direct result, modification of present team-teaching methods to provide more flexibility in class scheduling and more freedom for independent study is expected to come about.

Chamisa Elementary School, operational since February, is equally striking in design. It is divided into three circular pods containing 14 classrooms and an administrative and special services section, with gymnasium, art room, music room and library media center sandwiched in between.

Two of the pods, equally sized, contain classrooms and a circular center for multi-purpose use. Interior walls of all classrooms are sliding, accordion-type, panels which allow any combination of room arrangement ranging from a completely self-contained classroom to one large instructional area of 10,000 square feet. The mobility of the interior walls allows a more flexible approach to team and individualized teaching methods, known to the faculty as "team flexibility."

The third pod, somewhat smaller, contains administrative offices and special services.

This is a new era for school officials in Los Alamos, one they enter with eagerness, devoted to the planning of progressive education and facilities second to none.



Rodger Connellee, Eng-1, activates the air floatation pads that raise the 22,000-pound concrete door about an eighth-of-an-inch off the floor, allowing easy side-to-side movement. Connellee designed the door, using the air cushion principle, to be used as a radiation shield between a shop area and the iron house containing MP division's electron prototype accelerator, shown in background.

A Little Feller

By Ken Johnson

To even hear of such a thing as a 22,000-pound sliding door is awesome. To understand that something that massive floats on air is hard, and to actually see the door in operation, is downright impressive.

The door does exist. It's a concrete radiation shield used to plug the entryway between a shop area and the iron house containing MP division's electron prototype accelerator (EPA).

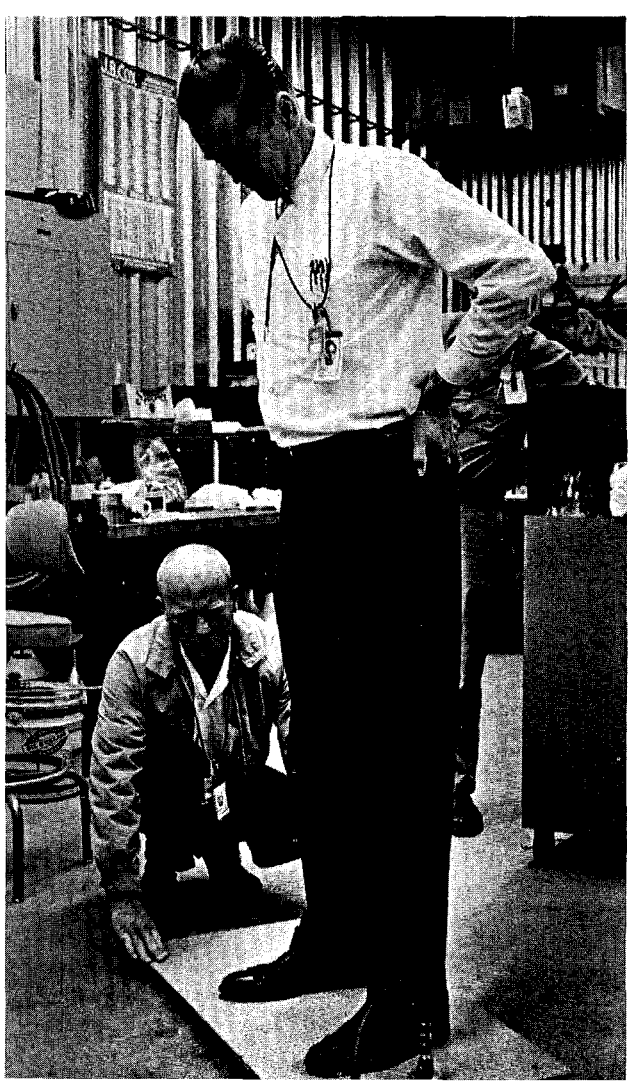
But Dean Keller, Eng-1, says, "He's just a little feller." He means the door is small compared to another that will be built in the future, and which will be explained later in this article. The "little feller" is almost 10 feet wide, better than 10 feet high and almost two feet thick, made of solid concrete sections.

It floats, on the air cushion principle, in a floor recess. The air cushion principal is the same that enables boats to skim above water, too shallow for other types of water vehicles—an air film is sandwiched between two surfaces.

Three flotation pads, made by Airfloat Corp., Decatur, Ill., are secured between the bottom of the door and the floor. Air pumped into the diaphragm on each of the pads, passes freely through the diaphragm holes and into the plenum beneath, and raises the door barely one-eighth-of-an-inch off the floor. The air that is forced out between the diaphragm and the floor forms a thin lubricating air film. The diaphragm is flexible and elastic, and thus

continued on next page

(Above): A floatation pad like the three used to raise the concrete door is examined by Charles W. Trask, Dean Keller and Bob Connellee, all of Eng-1. (Below): Keller is supported on the floatation pad which is receiving air from hose, shown at bottom. Connellee helps stabilize the pad.



Little Feller . . .

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deflects as it encounters obstacles, or fills out when it passes over depressions.

It might be thought that a large volume of air under high pressure would be needed to lift 22,000 pounds of concrete, but not so. The amount of air used exerts 14 pounds of pressure per square inch (less than that exerted on the human body from all directions at sea level). Each pad has 690 square inches of surface and so, is capable of supporting 9,660 pounds (14 x 690). Actually, according to Keller's figures, 14 pounds per square inch is more than is needed. The three pads have a total lifting capability of 28,089 pounds, or about 6,000 pounds more than the weight of the door.

A simple push-button switch, commonly found on many electrically powered machines, simultaneously activates the air cushion and one-horsepower electric motor which supplies power to slide the heavy door open and closed on a chain drive.

The door replaces a much heavier one, made of steel, which was supported and moved on steel bearings. Its usefulness for the EPA facility was far outweighed by its disadvantages. "We didn't have anything that could power its movement," Keller said. It had to be opened and closed with a 10-ton fork lift, which would preclude any fast entry to the linac iron house if need be. The bearings also wore grooves in the metal-plate floor recess and the door was frequently difficult to open, when small particles confronted the bearings.

Rodger Connellee, mechanical engineer for Eng-1 was called upon in mid-October to design a door that would better meet the needs of the EPA facility. He remembered seeing an air cushion platform at Ten-Site, used to transport and position heavy lead-glass windows, to be used for viewing remote control operations in hot cells.

Connellee studied the air cushion principal and discussed, with representatives of Airfloat Corp., the possibility of its use on a heavy door. After being assured it would work, Connellee designed the massive structure. The four concrete sections, making up the body of the door, were poured in the Zia shops. The sections were made so that they could be coupled together with steel pins. They were transported to the EPA building and assembled.

This was done in what is well known as a "jiffy". The accelerator prototype was to be put into use the week before Christmas, and its users didn't want to have to wait for such a thing as a door.

Six weeks later the door was installed and was as operational as the accelerator.

What are other advantages of the air cushion principal and how else might it be used?

Keller was right when he said, "He (the door) is

continued on next page

11 Scientists in Arctic-Antarctic Expedition

Eleven LASL scientists are on their way home after taking part in an expedition to make comparative studies--during the equinox--of aurorae and other atmospheric phenomena in the Arctic and Antarctic.

Dr. Neel W. Glass, J-16 group leader and overall scientific leader for the expedition, and eight others from Los Alamos were based at Christchurch, New Zealand. Two were stationed at Anchorage, Alaska.

The Aurora Australis was studied from a jet-engined "flying laboratory," which was flown into the Antarctic regions four times during the last week of March.

Another team, in a sister aircraft from Anchorage, flew on a schedule, precisely timed to permit observations of the Aurora Borealis in the Arctic region, to be simultaneous with observations of the New Zealand team.

The Atomic Energy Commission was the primary sponsor of the study mission. A National Aeronautics and Space Administration satellite was used for direct communication between the two Air Force planes.

Preliminary studies made in the same way last year indicated that changes of patterns and light intensities of the auroras occur at exactly the same times in both southern and northern hemispheres. The data contributed much to understanding of the shapes of the earth's magnetic fields and to knowledge about the behavior of auroras and the "solar wind" of electrically charged particles which flow outward from the sun.

LASL scientists taking part in the study from Christchurch were Glass; Robert Peterson, Dick Tatro, Lucien Black, and Dick Wakefield, all of J-16; and Joe Hollinrake, Dan Stillman, and Walt Wolff, all of J-8. B. C. (Carl) Lyon, J-DO, coordinated arrangements prior to arrival of the group at Christchurch and participated in ground operations in the study.

Participating in the study out of Anchorage were Paul Rudnick and Lee Sprouse, both of J-16.

obituaries

Adiopoldo Trujillo, animal caretaker, H-4, died recently at the Los Alamos Medical Center after an extended illness.

Trujillo, 43, had worked in Los Alamos since 1944, first for Brown and Olds Construction Co., then for the U.S. Engineers and Zia. Co., prior to joining LASL in 1954.

Services and interment were at Alcade.

Memorial services were held recently for **Dr. Thomas R. Roberts,** LASL physicist and President of the University of New Mexico Board of Regents, who was found dead in his laboratory.

Circumstances indicated that Roberts, 44, had taken his own life. He had been in ill health in recent months.

He had been employed by LASL since 1951. He served on the New Mexico Legislature as Representative from Los Alamos County from 1957 to 1960. Roberts was appointed a Regent of the University of New Mexico in 1961, and in 1967 was reappointed to a second term. He was elected President of the Board of Regents in March of last year.

Little Feller . . .

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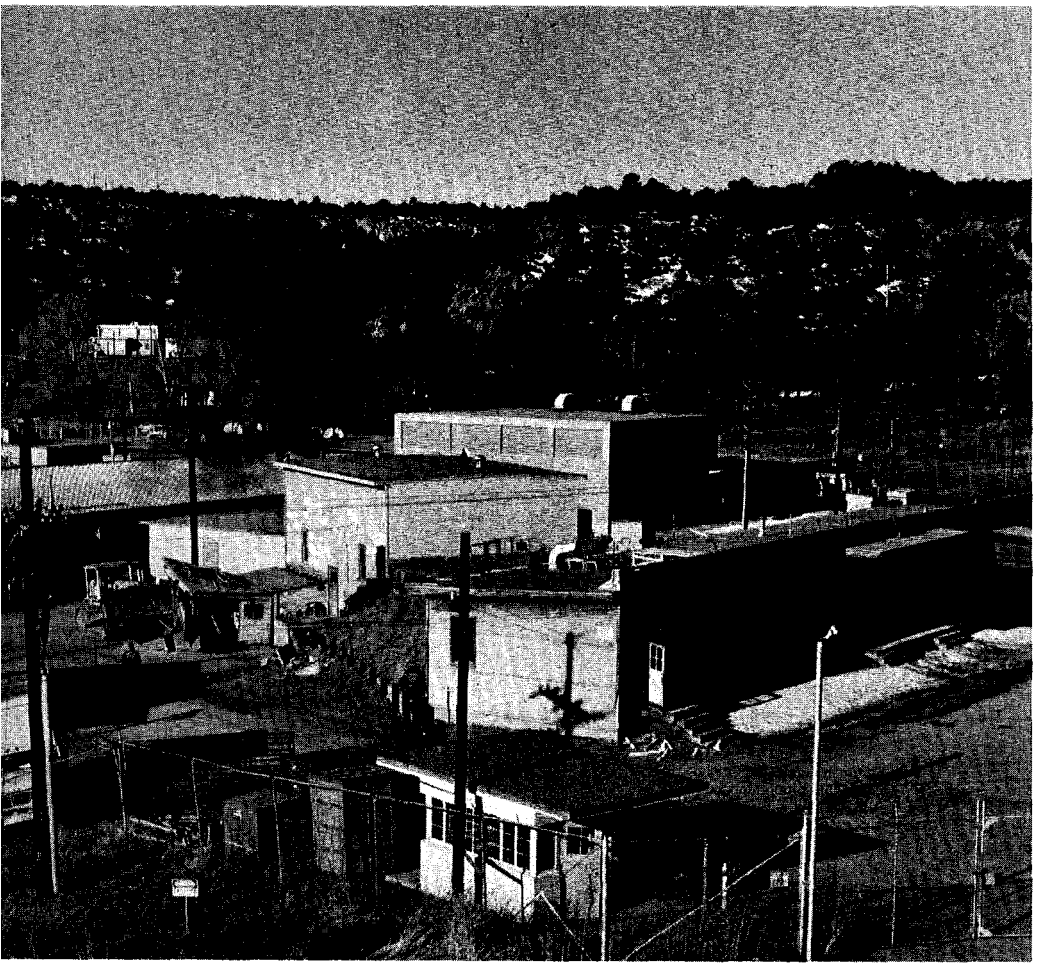
a little feller," when it is compared to another that will soon be built. A similar type door weighing 200,000 pounds will be built as the gateway to the planned Los Alamos Meson Physics Facility (LAMPF) linear accelerator, using the air cushion principal. While the electron linac may be a prototype of the LAMPF proton accelerator, its door which protects the experimenters from harm will also prove to be a prototype of another.

The floating radiation shield door is not only easier and more efficient to operate, it is also more economical. The door to be built for the Meson Facility is expected to cost approximately $50,000 less than another type that was originally intended.

Another plan, will also save time and money. A klystron tube, which supplies radio frequency power to the MP compex, had to be lowered into place through a hole cut in the ceiling of the building. The apparatus exceeds 10 feet in height—too big to be carried through a door by heavy moving equipment. A total of 45 klystron tubes will be arranged in seven buildings at the Meson Facility. Anticipating the problems involved in moving the tall tubes, plans were made to provide locations with 30-foot ceilings, to allow sufficient door clearance and room to maneuver machinery necessary to transport them. MP-2's Bob Kandarian snatched at the idea of using air cushions to transport the klystrons and thus, the ceilings will be maintained at 15 feet, a great saving in materials and construction costs.

Use of the air cushion principal at LASL is proving, in many ways, to be more efficient and economical.

The Future Calls . . . And A Landmark Falls



A Zia bulldozer battered its way through the walls of 24-year-old TA-18-1 recently, wiping out the original structure at Pajarito Site and opening the door to future expansion.

The landmark, constructed in December of 1944 by the late R. E. McKee, was the original office-laboratory facility at the site, established for experiments using high explosives for magnetic implosion measurements.

Zia operator Nelson Anglin, under the direction of Field Engineer Don Newland, skillfully manuevered the dozer's blade into the solid walls of the wooden structure, smashing it and 24 years of LASL history into kindling. A small storage shed, connected to the "High Bay Area" Building, located to the rear of TA-18-1, was also razed.

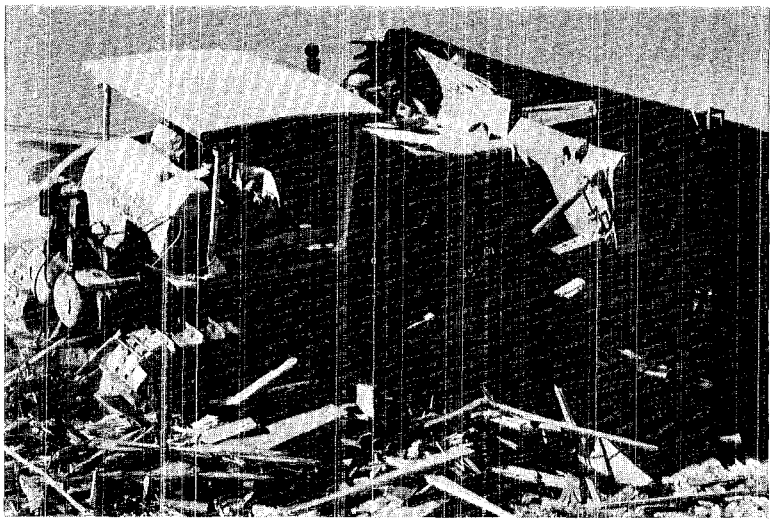
The debris was taken to the contaminated dump area for burial. Further use of materials in the buildings was prohibited because possible traces of radioactive materials could cause contamination.

Of significance is the fact that TA-18-1 was connected by tunnel to the High Bay Area Building in which the well-known "Slotin Accident" occurred May 21, 1946. Dr. Louis Slotin, a Laboratory scientist, died nine days later of early radiation effects caused by exposure in a criticality accident.

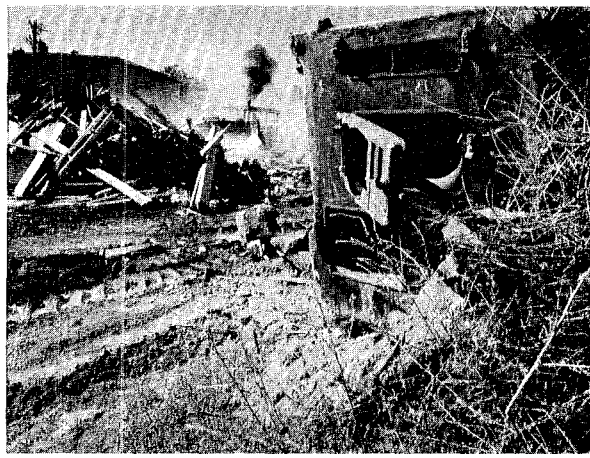
A few minutes was all it took to erase a small storage shed connected to the High Bay Area Building. Then Zia operator Nelson Anglin drove the dozer blade into the walls of Pajarito Site's original building, center. The project was under the supervision of Field Engineer Don Newland.

Beginning the project of tearing down Building TA-18-1, Nelson Anglin rams the Zia bulldozer into a corner.

Debris from the partially destroyed building was used as a ramp, and then the Zia bulldozer operator shot for the roof.

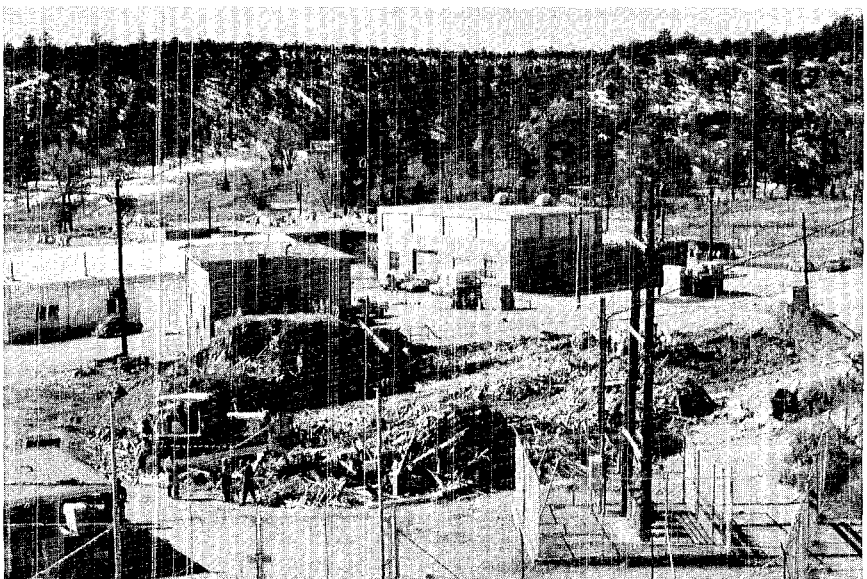


A look from inside the building revealed that the construction was unusually stout. Studs used in framing were 2x6's on 10-inch centers.



Three hours later TA-18-1 was no more. The debris was taken to the contaminated dump area for burial. Tunnel connecting the building to the High Bay Area is exposed at left center of photo. It was covered over the next day.

The old oil furnace was pushed to the side so that destruction could be completed more conveniently.



Nearly done, the dozer blade batters the last remnants of the 24-year-old building into kindling.

The Technical Side

Presentation at Instrument Society of America Instrumentation Symposium on: "Application of Digital Techniques to Instrumentation," Albuquerque, Jan. 11:

"Application of a Digital Computer to a Nuclear Reactor Instrumentation System" by L. Weintraub, K-4

Presentation at Meeting of San Juan Chapter of the Colorado Professional Engineers, Durango, Colo., Jan. 11:

"The UHTREX Project" by J. H. Russell, K-4

Third Annual Institute of Industrial Medicine, Aspen, Colo., Jan. 11-12:

"Fundamental Methods and Problems in Respiratory Protection in Industry and Mines" by E. C. Hyatt, H-5

"Problems of Respiratory Protection in Uranium Mining" by T. L. Shipman, H-DO

Nuclear Engineering Seminar, University of New Mexico, Albuquerque, Jan. 12:

"The Los Alamos Nuclear Rocket Program" by F. P. Durham, N-DO

Seismic Decoupling Meeting, Stanford Research Institute, Palo Alto, Calif., Jan. 15-16:

"The Equation of State of Mixtures, Alloys and Compounds" by R. G. McQueen, J. N. Fritz, S. P. Marsh and W. J. Carter, all GMX-6

Colloquium at Physics Department and Nuclear Science Department, Ohio State University, Columbus, Ohio, Jan. 16:

"Dense Plasma Focus" by J. W. Mather, P-7

Colloquium, The Sandia Corporation, Albuquerque, Jan. 17:

"The Proposed Los Alamos Meson Factory Project" by Louis Rosen, MP-DO

Presentation at Oak Ridge National Laboratory, Oak Ridge, Tenn., Jan. 18:

"A Search for States in ^{5}H and ^{9}Li by Means of the $^{3}H(t,p)$ and $^{7}Li(t, p)$ Reactions" by P. G. Young, Jr., P-12

Physics Meeting, Physics Department, Kansas State University, Manhattan, Kans., Jan. 19:

"Transition States in (d, pf) and (t, pf) Reactions" by F. A. Rickey, Jr., P-DOR

Presentation at the American Physical Society Meeting, Chicago, Ill., Jan. 20-Feb. 1:

"Energy Transport in Disordered Anharmonic Lattices; Numerical Experiments" by W. M. Visscher, T-9

Seminar, Lawrence Radiation Laboratory Radiochemistry Group, Livermore, Calif., Jan. 23:

"Advances in Bomb Diagnosis through Radiochemical Detectors" by D. W. Barr, J-11 (Classified talk)

Plutonium Research Coordinating Committee Information Meeting, Lawrence Radiation Laboratory, Livermore, Calif., Jan. 23-24:

"Structural Studies of Plutonium Intermetallic Compounds" by D. T. Cromer, CMF-5

"Observed Phase Transformations in High Purity Plutonium during Quenching from Elevated Temperatures" by D. R. Harbur, CMB-11

"Some Remarks on the Plasticity of Alpha Plutonium" by S. E. Bronisz, CMF-5

Electron Beam Welding Conference, Rocky Flats, Golden, Colo., Jan. 24-25:

"Electron Beam Welding Activities at LASL" by D. J. Sandstrom, CMB-6

Presentation at Rio Grande Chapter of the Association for Computing Machinery, Las Vegas, N.M., Jan. 26:

"The History of Computing" by W. J. Worlton, T-1 (Invited paper)

Seminar at California Institute of Technology, Pasadena, Calif., Jan. 29:

"A Model-Based Mass Law" by P. A. Seeger, W-8

Presentation at Central Ohio Section of the Society for Nondestructive Testing, Inc., Columbus, Ohio, Jan. 29:

"The Demands from and the Responsibilities of the Nondestructive Testing Profession in the USA" by G. H. Tenney, Dir. Off.

Atomic Energy Commission Contractor Health Protection Meeting, Augusta, Ga., Jan. 30-31:

"Laser-Safety" by H. J. Ettinger, H-5

American Astronomical Society Special Meeting on Solar Astronomy, Tucson, Ariz., Feb. 1-3:

"Satellite Measurements of Interplanetary Shock Waves" by J. T. Gosling, High Altitude Observatory, Boulder, Colo., J. R. Asbridge, P-4, S. J. Bame, P-4, A. J. Hundhausen, T-12 and I. B. Strong, P-4

"Ion Composition of the Solar Wind" by S. J. Bame, P-4, A. J. Hundhausen, T-12, J. R. Asbridge and I. B. Strong, both P-4

"The Propagation of Blast Waves in the Solar Wind" by A. J. Hundhausen, T-12 and R. A. Gentry, T-3

Physics Department Colloquium, Purdue University, Lafayette, Ind., Feb. 2:

"Spectroscopy of ^{235}U" by F. A. Rickey, Jr., P-DOR

American Crystallographic Association Meeting, Tucson, Ariz., Feb. 4-7:

"The Crystal Structure of Triclinic $(NH_4)_4THF_8$, Monoclinic $(NH_4)_4UF_8$, and Related Compounds" by A. Rosenzweig, University of New Mexico, R. R. Ryan, CMF-4, R. A. Penneman, CMF-4, and D. T. Cromer, CMF-5

"Laser Techniques in the Interpretation of LEED Patterns" by W. P. Ellis and B. D. Campbell, both CMB-8

"Thermal Motion in Sodium Alum $NaAl(So_4)_2 \cdot 12H_2O$" by D. T. Cromer and M. I. Kay, both CMF-5

Eclipse Symposium, Comissao Nacional de Atividades Espaciais at Sao Jose dos Campos, Sao Paulo, Brasil, Feb. 5-11:

"16-40 A Coronal X-Ray Emission During the 12 November 1966 Eclipse" by H. V. Argo, P-14, J. A. Bergey, P-1, W. D. Evans, P-4 and S. Singer, P-4 (Invited talk)

"Eclipse Predictions for Aircraft" by A. N. Cox, J-15

"A Tracking Telescope for Coronal Observations of a Solar Eclipse from a Jet Aircraft" by D. Liebenberg, National Science Foundation, Washington, D.C., M. M. Hoffman, J-12, R. E. Partridge, J-DO and B. G. Strait, N-4

"Coronal X-Ray Spectroscopy" by H. V. Argo, P-4 (Invited talk)

Colloquium at Stanford University, Palo Alto, Calif., Feb. 7:

"Direct Interaction Studies with 20-MeV Tritons" by E. R. Flynn, P-10

Colloquia at: Massachusetts Institute of Technology, Cambridge, Mass., Feb. 6; Princeton University, Princeton, N.J., Feb. 7; and Brookhaven National Laboratory, Upton, N.Y., Feb. 8:

"One and Two Nucleon Transfer Reactions and the Shell Model Description of the ^{208}Pb Region" by G. J. Igo, P-DOR

Symposium on Radiation Effects on Propulsion Systems and Explosives, Palo Alto, Calif., Feb. 7:

"The Effects of Radiation on Explosives" by E. D. Loughran, GMX-2 and T. A. Sandford, GMX-3 (Classified talk)

"Recent Tests on Warhead Detonators" by T. R. Gibbs, GMX-7 (Classified talk)

14th Meeting of the Interagency Mechanical Operations Group Subgroup on Environmental Testing at the DuPont Savannah River Plant, Aiken, S.C., Feb. 7-8:

"Data Reduction at Group GMX-3, LASL" by R. W. Mathews, GMX-3

Seminar at Arizona State University, Tempe, Ariz., Feb. 8:

"Studies of Oxide Surfaces by Low Energy Electron Diffraction" by W. P. Ellis, CMB-8

Seminar on Nondestructive Testing, University of New Mexico, Albuquerque, Feb. 9-10:

"Radiation and Novel Nondestructive Testing Methods" by D. E. Elliott, GMX-1

"Ultrasonic and Electromagnetic Testing" by N. B. Edenborough, GMX-1

Department of Electrical Engineering Seminar, University of Colorado, Boulder, Colo., Feb. 13.

"Characteristics of the Los Alamos Meson Physics Facility Accelerator" By F. R. Tesche, MP-5

Mechanical Engineering Seminars, University of New Mexico, Albuquerque, Feb. 13 & 20.

"Plasticity in Engineering Design" by C. A. Anderson, GMX-3

Colloquium at the University of Minnesota, Minneapolis, Minn., Feb. 14:

"Spectroscopy of ^{235}U" by F. A. Rickey, Jr., P-DOR

Colloquium at the University of New Mexico, Albuquerque, Feb. 15:

"Toward Nuclear Fission—The Transition State Nucleus" by J. D. Cramer, W-8

Colloquium at State University of New York at Stony Brook, Stony Brook, N.Y., Feb. 15:

"Spectroscopy of ^{235}U" by F. A. Rickey, Jr., P-DOR

Nuclear Engineering Seminar, University of Texas, Austin, Texas, Feb. 15:

"Coupled Reactor Kinetics: Pulsed-Neutron Analysis and Problems Pertaining to Modular Studies" by G. C. Hopkins, K-1

Department of Chemistry Seminar, University of New Mexico, Albuquerque, Feb. 16:

"Biochemical Markers in the Cellular Life Cycle" by D. F. Petersen, H-4 (Invited talk)

Lecture at Johns Hopkins Applied Physics Laboratory, Baltimore, Md., Feb. 16:

"Explosive Production of Multi-Megagauss Fields and their Application" by C. M. Fowler, GMX-6

12th Annual Meeting of the Biophysical Society, Pittsburgh, Pa., Feb. 18-21:

"Light Scattering by Biological Cells and its Relation to Cell Size" by P. F. Mullaney, M. A. Van Dilla and P. N. Dean, all H-4

"A New Spectrophotometer for Rapid Measurement of Fluorochrome-Stained Cells" by M. A. Van Dilla, H-4, J. R. Coulter, SD-5 and P. F. Mullaney, H-4

"Timing and Dose Dependence of Radiation-Induced Division Delay" by D. F. Petersen and R. A. Walters, both H-4

"Radiation Effects on Macromolecules Essential for Division" by R. A. Walters and D. F. Petersen, both H-4

"Determination of Volume Growth Rate and Division Probability of Mammalian Cells in Suspension Culture" by E. C. Anderson, H-4, G. I. Bell, T-DOT, D. F. Petersen, H-4 and R. A. Tobey, H-4

Seminar on Nondestructive Testing, University of New Mexico, Albuquerque, Feb. 9-10:

"Ultrasonic Testing" by N. B. Edenborough, GMX-1.

"Eddy Current Testing" by N. B. Edenborough, GMX-1.

Conference on Advances in Ultracentrifugal Analysis, New York

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the technical side . . .

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Academy of Sciences, New York, N.Y., Feb. 15-17:

"Theory of Sedimentation of Interacting Systems" by W. B. Goad, T-4 and J. R. Cann, University of Colorado Medical Center, Denver, Colo.

National Meeting of American Institute of Metallurgical Engineers, New York, N.Y., Feb. 18-22:

"Vapor Deposition in the Fabrication of Fission Thermocouples" by C. I. Fairchild, CMB-6, J. P. Bertino and W. J. McCreary, both CMB-8 and P. G. Salgado, K-4.

Department of Animal Science and Biochemistry Seminar, Colorado State University, Fort Collins, Colo., Feb. 19-20:

"Chemical Heterogomy in Man and Animals" by C. R. Richmond, H-4 (Invited talk).

"Biological Consequences of Large Energy Depositions in Small Tissue Volumes" by C. R. Richmond, H-4 (Invited talk).

Seminar at Ohio State University, Columbus, Ohio, Feb. 20:

"Los Alamos Nuclear Rocket Program" by C. W. Watson, N-2.

Seminar on Electronic Circuit Design by Computers, St. Charles, Ill., Feb. 21:

"The NET-1 Program" by A. F. Malmberg, T-7.

Seminar at the Department of Chemistry, University of New Mexico, Albuquerque, Feb. 23:

"ESR Studies of Some Transition Metal Complex Ions" by H. G. Hecht, CMF-2.

Department of Radiology Seminar, University of Washington, School of Medicine and University Hospital, Seattle, Wash., Feb. 27:

"Behavior Studies and Cellular Hematology of Rhesus Monkeys during Exposure to Gamma Radiation" by J. F. Spalding, H-4.

Presentation at Meeting of the Aerojet Management Club, Las Vegas, Nev., Feb. 27:

"Does Freezing Kill?" by R. S. Thurston, CMF-9.

Chemical Engineering Division Seminar, Argonne National Laboratory, Argonne, Ill., March 1:

"Computational Methods for Determination of Surface Tensions from Menisci" by J. C. Biery, K-2.

Second Conference on Neutron Cross Sections and Technology, Washington, D.C., March 4-7:

"Cosmic Abundances and the Extrapolation of Nuclear Systematics" by P. A. Seeger, W-8.

"Fission Cross Section Measurements: Present and Potential Capabilities" by J. A. Farrell, W-8.

"Neutron Cross Sections of ^{6}Li in the Kilovolt Region" by J. A. Farrell, W-8 and W. F. E. Pineo, Duke University, Durham, N.C.

"Criticality and Central Reactivity Calculations Using ENDF/B Data" by R. J. LaBauve and M. E. Battat, both K-1.

"Neutron Induced Fission Cross Section Measurements in ^{244}Cm" by R. R. Fullwood, J. H. McNally and E. R. Shunk, all W-8.

"^{238}U Neutron Capture Results from Bomb Source Neutrons" by N. W. Glass, A. D. Schelberg, L. D. Tatro, and J. H. Warren, all J-16.

"Techniques for Fission Cross-Section Measurements for Elements with High and Spontaneous Fission Activity" by P. G. Koontz and D. M. Barton, both N-2.

"Storage and Retrieval of Photon Production and Interaction Data in the ENDF/B System" by D. J. Dudziak and R. J. LaBauve, both K-1.

Noise Reduction Conference, Lawrence Radiation Laboratory, Livermore, Calif., Mar. 5-7:

"The Antiautocorrelator — A Scheme for Observing Transients in the Presence of a Quasi-Sinusoidal Background" by R. E. Partridge, Jr., J-DO.

29th Annual Southern Safety Conference, Aerospace Section, Mobile, Ala., March 5:

"Safety Control of Nuclear Risk" by Roy Reider, H-3.

Spring Meeting of the New Mexico Branch of the American Society for Microbiology, Health Research Laboratory, Los Alamos, March 8-9:

"Production of Heparin-Related Materials by Cultured Cells" by P. M. Kraemer, H-4.

"Enzyme Changes with Fertilization in the Sea Urchin Eggs" by C. H. Blomquist, H-4.

"Specific Localization of Colcemid Blocking Action in Metaphase" by R. A. Tobey, E. C. Anderson, and D. F. Petersen, H-4.

"The Nuclear Weapons Incident in Spain" by W. H. Langham, H-4.

"The Energy Metabolism of Mammalian Cells" by J. M. Machinist, H-4 and C. T. Gregg, H-4.

"Radiosensitive and Radioresistant Mutants of Hemophilus influenzae" by B. J. Barnhart, H-4 and S. H. Cox, H-4.

"Production of Synchronized Populations by Selection of Mitotic Cells" by D. F. Petersen, E. C. Anderson, and R. A. Tobey, all H-4.

Fourth Annual Symposium of the American Vacuum Society, New Mexico Section, Albuquerque, March 13-15:

"Desorption of Photons: Carbon Monoxide on Nickel" by J. P. Brainard, K-1.

"LEED Studies of Non-Stoichiometric Oxides" by W. P. Ellis, CMB-8 (Invited talk).

"LEED Studies of the Polar (0001) Surfaces of the II-VI Compounds of CdS, CdSe, ZnO, and ZnS" by B. D. Campbell, CMB-8.

Presentations at the Optical Society of America Meeting, Washington, D.C., March 13-16:

"Measurement and Removal of Ghosts in Spectra Recorded by Modern Gratings" by J. V. Kline, Colorado School of Mines, Golden, Colo. and D. W. Steinhaus, CMB-1.

"A Twelve-Channel, Triple-Etalon Fabry-Perot Spectrometer" by M. Daehler, P-15.

Robert Hayden Named EEO Officer at LASL

Robert J. Hayden, former assistant group leader in PER-1, has assumed duties in the newly created position of Equal Employment Officer at LASL, according to a recent announcement by Director Norris E. Bradbury.

Hayden has the full time responsibility of coordinating the Laboratory's Equal Employment Opportunities program (EEO), monitoring LASL's compliance with EEO regulations, surveying the Laboratory's progress in hiring of minority group applicants, and reporting the results to the Director's Office and to EEO officials within the Atomic Energy Commission.

Primary purpose for Hayden's appointment is two fold: First, to increase the number of minority and economically disadvantaged persons employed by the Laboratory by making a concerted effort to recruit and hire members of these groups; and second, to insure that the Laboratory's commitment to the EEO is generally known.

Hayden has been assigned to PER-DO and is located in Room 103 of Building SM-123. His new telephone number is 7-5447.

He joined the Laboratory staff in May, 1962. He was assigned to PER-1, and in October, 1966, was appointed assistant group leader. He is succeeded in that position by Lynn R. Wilson.

Mrs. Barbara Crabtree will be assistant to the Equal Employment Officer, and will be responsible for processing Youth Opportunity applicants. She will continue to be responsible for operation of the Housing Office.

new hires

CMB Division

Robert R. Critchfield, Albuquerque, CMB-3 (rehire)
Neva L. Noyes, Los Alamos, CMB-6
Verlyn V. Mahoney, Albuquerque, CMB-7
Gary S. Mayne, Grants, N.M., CMB-8
David G. Clifton, Santa Barbara, Calif., CMB-11 (rehire)
Michael E. Lazarus, Idaho Falls, Idaho, CMB-14

D Division

Daniel G. James, Albuquerque, D-8
Robert E. Stevens, Los Alamos, D-8

Director's Office

Kathleen A. Masters, Los Alamos, Dir. Off.

Engineering Department

Lawrence L. Bailey, Los Alamos, ENG-2
Jose C. Ortiz, University Park, N.M., ENG-2
Everett L. Miller, Powell Butte, Ore., ENG-4
Hubert C. Alexander, Jackass Flats, Nev., ENG-6
Ronald D. Boyd, Anniston, Ala., ENG-7

GMX Division

John W. Hopson, Jr., Austin, Tex., GMX-6
Dante Stirpe, Terre Haute, Ind., GMX-7 (rehire)

H Division

Margaret C. Bond, Los Alamos, H-2
Eddie C. Rivera, Espanola, H-4

J Division

Josephine M. Rose, Los Alamos, J-12
Laurina M. Riggs, Weatherford, Okla., J-16

K Division

Barry K. Barnes, Edgewood Arsenal, Md., K-1 (Postdoctoral)
Harold E. Strohm, Argonne, Ill., K-2
James A. Horak, Argonne, Ill., K-2

MP Division

Paul J. Tallerico, Ann Arbor, Mich., MP-2
Alice L. LaRotonda, Pittsburgh, Pa., MP-4

Mail and Records

Lorraine E. Montoya, Santa Cruz, N.M., M&R
Alex J. Salazar, Espanola, N.M., M&R-DO

N Division

Frederick Skoberne, Sunnyvale, Calif., N-DO
Walter E. Ely, Albuquerque, N-3

Personnel Department

Mary F. Saulsbury, Houston, Texas, PER-1

Public Relations Department

Kenneth J. Johnson, Gunnison, Colo., PUB-1
Janet M. Susco, Los Alamos, PUB-2

Shops Department

David C. Murphy, Albuquerque, SD-1
William M. Boedeker, Granite City, Ill., SD-1
Elva C. Williams, Boise, Idaho, SD-1
Michael D. Henke, Elk Grove, Ill., SD-2

Supply and Property Department

Richard L. Ebelacker, Espanola, N.M., SP-3
Jose A. Trujillo, Chimayo, N.M., SP-4

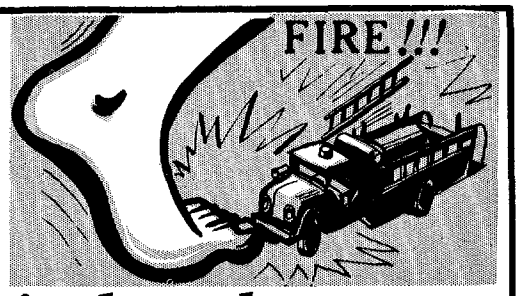
T Division

John F. D. Ulibarri, Los Alamos, T-1
Philip M. Blood, Seattle, Wash., T-1
Sharon S. Shadden, Los Alamos, T-1
Jimmy L. Long, Tulsa, Okla., T-1
Walter D. Barfield, Arlington County, Va., T-2
Richard J. Young, Berkeley, Calif., T-2
James R. Nix, Berkeley, Calif., T-9

W Division

Emile A. Bernard, Savannah River, Ga., W-4
Norris A. Nickols, Downey, Calif., W-4
Douglas W. Muir, Las Cruces, N.M., W-8

20 years ago in los alamos



Taken from the files of the April, 1948 Los Alamos Times by Robert Porton

Fire!!!!!!!!

If John Baldridge, 2998-D Trinity Drive, hadn't been so curious, he would not have been injured. It was midnight when John was awakened by the sound of the fire department investigating a call across the street. He dashed barefoot to the window, looked out, and after seeing that the fire was nothing worth staying up to watch, decided to return to bed. As he made his way across the darkened room, he received a painful injury to his foot. He had stepped on a toy fire truck.

Los Alamos Residents To Vote In First State Election

The estimated 3500 to 4500 Los Alamos residents eligible to vote in the forthcoming state elections will register from April 13th through April 16th. The Sandoval County Clerk has ruled that the Los Alamos precinct will be divided into ten wards. Registration will be by notarization and Hill notaries have indicated their willingness to volunteer their services. The local chapter of the League of Women Voters will conduct the registration. State officials expressed satisfaction to finally see residents of Los Alamos get their franchise.

CBS President Visits Project

Frank Stanton, President of the Columbia Broadcasting System, visited Los Alamos this week accompanied by his wife. He said that local station KRS has studios which are well designed for presentation of all types of programs. Upon learning of the high interest in classical music programs here, he will arrange for CBS to ship their entire Columbia masterworks series of records gratis to the station for enjoyment by Hill listeners.

Toastmasters To Form On Hill

Headquarters of Toastmasters International, Inc., this week received the formal charter application from the Los Alamos club, newest in the family of growing Hill organizations. Ralph C. Smedley, Santa Ana, California, president of the International organization, has been invited to present the charter at ceremonies later this month. District Governor George McKim, Albuquerque, and members of the Duke City group demonstrated the process of the typical meeting and assisted in the organization of the local chapter.

what's doing

OUTDOOR ASSOCIATION: No charge; open to the public. Contact leader for information about specific hikes.

Sunday, April 7, Buckman Mesa. Betty Hansbury, leader, 8-4104.
Sunday, April 14, Call Terry Gibbs, leader, for information, 8-4909.
Sunday, April 21, Alamo Canyon from Upper Crossing. Don Hoard, leader, 672-3356.
Friday, April 26, Meeting, Hospitality Room, Los Alamos National Bank, 7:30 p.m.
Sunday, May 5, Pine Springs from Sportsmen's Club. Dibbon Hagar, leader, 2-6209.

MESA PUBLIC LIBRARY EXHIBITS:

Art Exhibit:

April 1 through 29—Still Life Paintings by New Mexico artists (traveling exhibit from the Museum of New Mexico).

Case Exhibits:

March 19 through April 8—Los Alamos Concert Association
April 8 through 19—National Library Week
April 19 through 26—National Secretaries Week
April 1 through 29—Los Alamos Chess Club

LOS ALAMOS CHORAL SOCIETY, with Los Alamos Sinfonietta (joint presentation), "King David," by Honegger, Sunday, April 21, 3 p.m., Civic Auditorium. Sinfonietta season tickets will apply; individual tickets sales (available April 1) from Decol's, Hayes Jewelers, Gift-World Imports, or from members. Advance tickets $1.50 for adults ($1.75 at door); students 75c.

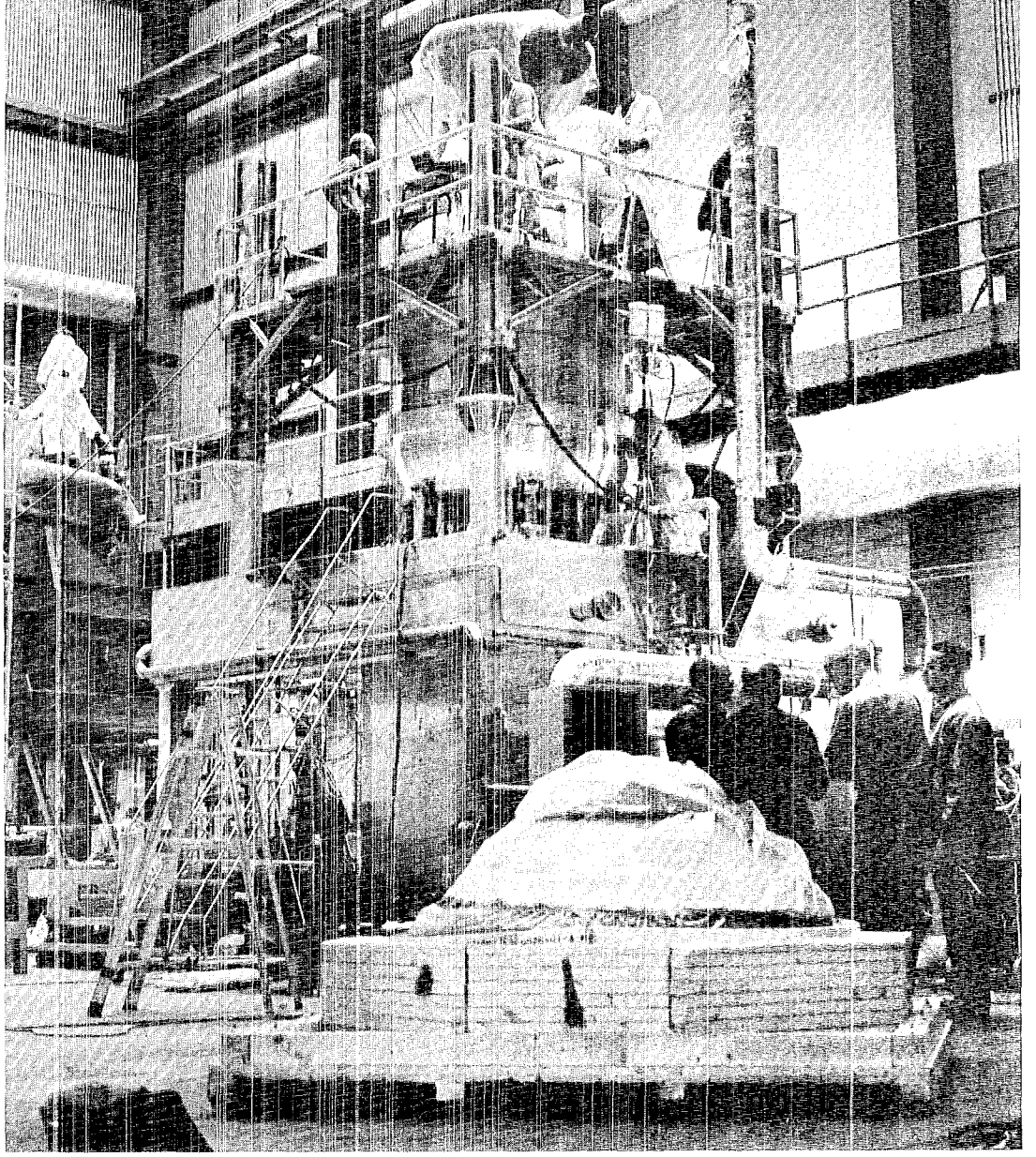
LOS ALAMOS CONCERT ASSOCIATION:
Tuesday, April 2—Guarneri String Quartet, 8:15 p.m., Civic Auditorium.

PUBLIC SWIMMING: Los Alamos High School pool. Adults, 50 cents; students 25 cents. Pool closed Thursdays.

Monday, Tuesday, Wednesday, and Fridays, 7:30 to 9 p.m.
Saturday and Sunday, 1 to 6 p.m.
Sunday, 7 to 9 p.m. Adults only.

SCUBA TRAINING: 1968 Scuba training and practice sessions begin April 17 at the Los Alamos High School. Basic skills of scuba necessary for safe diving will be taught. Contact the Los Alamos Sportsmen's Club for further information, or C. B. Mills, chairman, water sports.

BEAUX ARTS BALL: Saturday, April 27, 9 p.m. to 1 a.m., Recreation Hall. Music by Ed Macmann and the All-Stars. Theme is "Shipwreck." Costumes optional. Door prizes. Tickets at $3.50 per person or $7 per couple; available from Mrs. Raymond Gray, 2-6001; Lobby Shop of the Los Alamos Medical Center; or any Hospital Auxiliary member. All proceeds to LAMC Hospital Emergency Fund.



Assembly of the LASL Phoebus 2A reactor, third of the Phoebus series in Project Rover, is underway in the R-MAD Building at the Nuclear Rocket Development Station at the Nevada Test Site.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